Section 3

Service
Operations and Adjustments

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IMPORTANT NOTE

FOR ORACLE JDE/SIEBEL SYSTEMS, PART NUMBERS SHOWN IN THIS MANUAL SHOULD BE CONVERTED AS FOLLOWS:

PFE	**ORACLE JDE/SIEBEL**
B1-2345-A	PFEB12345A
B1234A	PFEB1234A
123-456	PFE123456

CAUTION!

Prior to carrying out any maintenance procedures on the Maximailer, the following safety precautions must be observed:

- **Switch the machine OFF and disconnect the mains cable from the power supply - do not remove any cover before doing this.** *Failure to isolate the mains could result in death or injury!*

- **Before switching the machine back on after completion of maintenance work, ensure all external covers are in place and undamaged. Replace any covers that are damaged.**

PUT SAFETY FIRST!

3.1 PRELIMINARY OPERATIONS

3.1.1 PREVENTATIVE MAINTENANCE - GENERAL

This section details the removal of the machine covers, and Preventative Maintenance.

3.1.2 REMOVAL OF COVERS

Note: throughout this manual, references to LH and RH are viewed from the far end of the machine, looking towards the insert head, ie. LH is operator side, RH is drive side. Some or all of the following covers may require removal for service operations and Preventative Maintenance. *Ensure all covers are undamaged. Check action of opening covers to confirm correct operation, and that safety microswitches function correctly. Check that all warning labels are legible. Exercise caution with moving parts and exposed electrical apparatus when covers are removed.*

Insert head

1. **RH side cover:** Lift top perspex cover and remove screw at rear end inside chassis face. Lift closer closer and remove screw at front end inside chassis face.
2. **RH lower edge cover:** Remove side cover first, then remove 2 x screws on brackets inside, drop cover slightly to clear lugs (when replacing, ensure lugs are properly engaged).
3. **LH side drop down:** Lower cover, then remove 2 x retaining straps & 2 x 'E' clips securing pivot bar.
4. **LH side main cover:** Drop down the front cover, then remove 1 x screw on front inside edge at top, 2 x screws rear inside edge midway.
5. **LH side control panel cover:** Attached to panel assy. with 4 nuts. Remove assembly by 2 x screws at rear edge (1 inside chassis, 1 outside), then 3 x screws at front edge inside chassis (raise roller platten to access).
6. **Closer cover:** Remove/lower side covers, then 1 x screw each side at the pivots.

Feeder

1. **RH side cover:** 1 x screw on both front and rear top corners, inside chassis face (open top/closer covers to access).
2. **RH lower edge cover:** Remove side cover first, then remove 2 x screws on brackets inside, drop cover slightly to clear lugs (when replacing, ensure lugs are properly engaged).
3. **LH side drop down:** Lower cover, then remove 2 x retaining straps & 3 x nuts on hinge.
4. **LH lower edge cover:** Remove side cover first, then remove 2 x screws on brackets inside, drop cover slightly to clear lugs (when replacing, ensure lugs are properly engaged).

Tower Feeder

1. **RH side cover:** 1 x countersunk screw inside chassis at front top, 1 x screw inside chassis face below lower tray.
2. **RH lower edge cover:** Remove side cover first, then remove 2 x screws on brackets inside, drop cover slightly to clear lugs (when replacing, ensure lugs are properly engaged).
3. **LH side drop down:** Lower cover, then remove 2 x retaining straps & 3 x nuts on hinge.
4. **LH lower edge cover:** Remove side cover first, then remove 2 x screws on brackets inside, drop cover slightly to clear lugs (when replacing, ensure lugs are properly engaged).
5. **Top tray undercovers:** Remove RH cover, lower LH cover. Remove 3 screws each side on chassis, 1 x screw each side on top of tray.
6. **Bottom tray undercovers:** Lower LH cover. Remove 1 screw on side of chassis, 1 x screw each side on top of tray.
6. **Front cover:** Remove retaining strap inside cover. Remove 1 x screw each side on pivots, unclip ribbon cable and unplug connector from PCB. Feed ribbon through hole while removing.

3-Plate Folder

1. **RH side cover:** Open front roller platten and daily post cover. Remove 1 screw at top, inside chassis in front of feed tray, 1 x screw in front of daily post tray. Lift cover upwards to free lugs.
2. **RH lower edge cover:** Remove 1 x countersunk screw at rear, 1 x screw inside chassis at front.
3. **LH side cover:**Cover hinges open. Black safety cover inside is held with 2 x screws at top edge inside chassis (open jam access assy. to reveal).
4. **Accumulator underpanel:** Remove 6 x screws from below.

2-Plate Folder

1. **RH side cover:** 1 x screw inside chassis at front top, 1 x screw inside chassis face below tray.
2. **RH lower edge cover:** Remove side cover first, then remove 2 x screws on brackets inside, drop cover slightly to clear lugs (when replacing, ensure lugs are properly engaged).
3. **LH side drop down:** Lower cover, then remove 2 x retaining straps & 3 x nuts on hinge.
4. **LH lower edge cover:** Remove side cover first, then remove 2 x screws on brackets inside, drop cover slightly to clear lugs (when replacing, ensure lugs are properly engaged).
5. **Opening top cover:** Remove/open side covers first, then remove 1 x cap head screw each side inside.
6. **Front cover:** Remove/open side covers first, then remove 1 x screw each side at top and 3 x screws on LH chassis face. **Note:** depending upon configuration, infill cover may be fitted, held by lower 2 of the 3 screws.

3.1.3 PM SCHEDULE

The preventative maintenance schedule **must** be carried out as defined in this section. Service and breakdown statistics gathered from past field experience show that failure and breakdown rates are dramatically reduced by adhering to the PM schedule.

The extent of preventative maintenance required will depend upon machine usage and is divided into three levels: Operator, Intermediate and Full. The time required for each level differs considerably, and estimated times are given in the schedule for each operation. The first page provides guidelines for how often each level should be carried out.

The schedule is sectioned for insert head, feeders, folders and DTI. As well as specific times for each operation, the total estimated time required for each level is shown at the end of each of the sections.

The full PM schedule is shown on the following page.

Preventative Maintenance Guidance and Schedule

The Maintenance schedule below is applicable to the 100/140 product range and must be strictly followed to guarantee machine performance and reliability.

This schedule is based on a monthly cycle count of 200,000 or 50 hours running, which is considered the normal maximum. If the machine is running less than this, the PM should still be carried out with the same frequency, but fewer parts will be required.

See typical examples below on when to carry out a PM – this may apply to your machine.

- If the machine is running for **<4 hours per day** then a **Full PM**[1] must be carried out **every 125 working days or 6 months**.

- If the machine is running for **4 - 8 hours per day** then an **Intermediate Service**[1] must be carried out **every 3 months followed by a FULL PM**[1] **at 6 months.**

- If the machine is running for **>8 hours per day** then an **Intermediate Service**[1] must be carried out **every month**

  followed by a FULL PM[1] **at 6 months.**

[1] See Page 8 for definitions.

Note the information above is only a guideline and may vary depending on individual applications. A very large departure from the above volume may require a lower frequency of PM.

Useful guidelines before implementing the schedule

If the machine has been running for some time and you start to get issues, ask, "**What has changed**"?

Try not to panic and adjust the machine settings – because it had been working!!

Ask how the machine has been working lately and use this information as a guide for checking the machine.

Why am I getting Insertion crashes? – Possible causing could be: -

a. Envelope feed problems – struggle to feed when the hopper is fully loaded.

Do you have the correct set-up to run these envelopes? Tractor feed or standard feed? Check and Implement actions 1-7 as per the guideline document for good feeding – see appendix on page 41.

b. Skewed envelopes at insertion – resulting in finger entry problems. Check the obvious (side guides clearances, separator gap is even & not too tight and joggler feed tyres are aligned). Check the tapes leading into the deskew rollers (if applicable) are intact and free from damage.

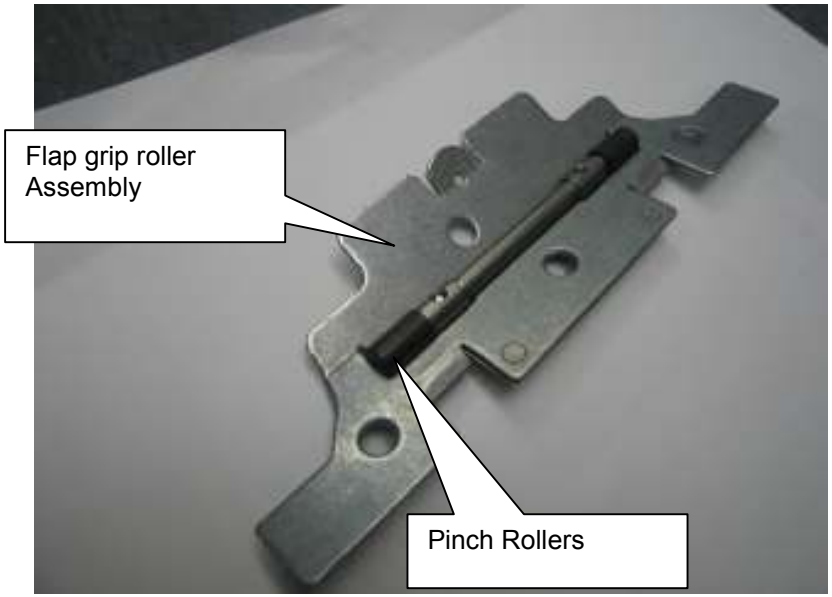
c. Variation in Envelope stop position – this should be within the notch position with very little variation (Max 2mm overall). If this variation is greater than 2mm than the following actions **must** be carried out:-

1. **Remove envelope feed assembly to check/clean the pinch rollers**. These rollers are located on the flap grip assembly and can be susceptible to build of dust and toner with particular envelopes. With time a dark layer of residue can build-up leading to the pinch rollers not turning freely.

   This residue can be easily removed with cloth and using Rubber Roller Restorer (E0483A). Use an air duster to remove any free particles before re-assembling. Nb. Care must be taken not to score or damage the plastic rollers – this will lead to paper catch points.

   After cleaning, check for any flat spots on the rollers – this can also cause a variation in stop position. If flat spots are found on the rollers – they must be replaced.

Note: Lubrication on the flap roller bar and pinch rollers will cause particles to adhere and exacerbate the problem and therefore should be avoided.



2. Wrap Spring Type Clutch/brakes – if this starts to make a squealing noise then this is a sign of fretting wear debris caused by loss of lubrication within the clutch. Other signs include dark brown debris around the clutch case. As a temporary measure, the clutch can be removed and cleaned (EC25 versions only) and some lubricant (mineral based oil) can be applied carefully underneath the rotating control ring. Then spray the spring coil with roller cleaning fluid and run a sheet of paper through each coil to remove debris. Dry spring and reassemble clutch. If after cleaning the variation is still not consistent – then the clutch will require replacing. Alternatively Long life versions can be fitted – for part numbers see below.

Long Life Clutch part numbers

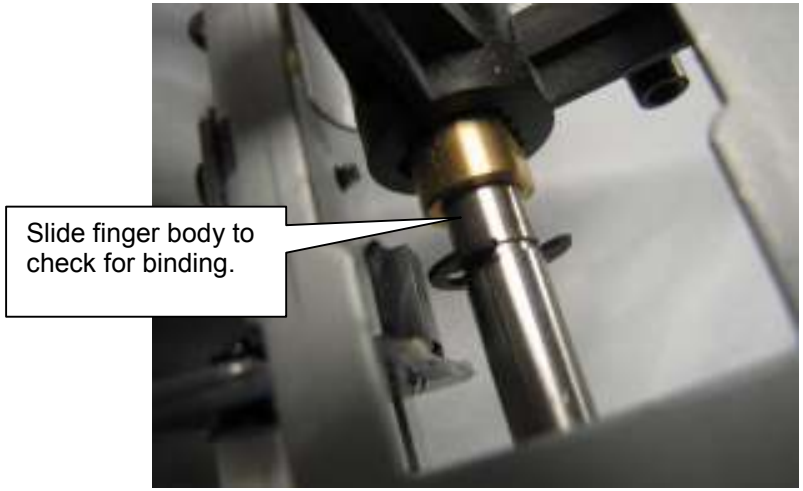
Standard Clutch Part Number	Long Life Clutch Part Number
179-213 Clutch EC30 CW 8mm 24v (YLW)	179-109 Clutch EC30 LL CW 24v 8mm (YLW)
179-214 Clutch EC30 CCW 8mm 24v (BLU)	179-110 Clutch EC30 LL CCW 24v 8mm (BLU)
181-117 Clutch W/D XH 102-10 CW	181-155 Clutch W/D EC25 LL CW XH 24v
181-127 Clutch W/D XH 102-20 CCW	181-156 Clutch W/D EC25 LL CCW XH 24v
181-104 Clutch W/D 102-10 CW	181-1590 Clutch W/D EC25 LL CW SM 24v
181-105UL Clutch W/D 102-20 CCW	181-140 W/D Clutch EC25LL 24v SM CCW

d. Fingers not returning cleanly and finger digging into the envelope.

1. Fingers not returning cleanly home and sticking during insertion. This check can be done in-situ without taking the finger assembly out of the machine. Energise the fingers by hand by lifting up the finger arm – the finger arm should fall back to rest. It may be worth trying this a couple of times to highlight the problem. If they fail to fall back then the finger assembly will need to be removed from the machine to locate the problem.

Check finger body pivots are free on the shaft. To check this remove the e-clips that hold the middle finger arm and slide the finger body sideways. If binding, there will be a dark green residue on the lead screw shaft once the arm is moved sideways.

This residue can be easily removed with a cloth and using Rubber Roller Restorer (E0483A). Use an air duster to remove any free particles before re-assembling.



2. Fingers digging into the envelope. Check and implement note 10 and 13 as per the guidelines for good insertion – see pages. 50-52. If the fingers are still digging – then replace with the appropriate type:-

Standard fingers for use with the 4mm pin are B9346A and B9347A.
Standard fingers for use with the 3mm pin are B9202A and B9203A.

Wide fingers for use with 3mm pin are B9156A and B9157A.
Wide fingers for use with 4mm pin are B9319A and B9320A.

Maintenance Schedule – Head

Level 1 = Operator level (frequency will depend on usage and applications).
Level 2 = Intermediate Service (frequency usually ½ FULL PM).
Level 3 = FULL PM Service.

Check software versions and implement mandatory updates within TB's and TT's every Level 3 Service Interval (available on the PFE website).

Item #	Maintenance item – Head Unit	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
A1	Clean all paper transport rollers using water or recommended cleaning fluid. Check joggler tyres (if fitted) for alignment.	Level 1,2 & 3	<5	-		
A2	Clean wetter area - use a damp cloth to remove all wetter fluid deposits around the wetter and closer rollers. Excess water is usually a sign of over-wetting – and it may require adjusting. Do not make any adjustments in the GUI initially.	Level 1,2 & 3	<5	-		
A3	Vacuum clean to remove internal dust. Clean all covers.	Level 2 & 3	<5	-		
A4	Remove and clean wetter sponge and tank (A7042A). Clean area where the wetter tank sits. Note, the sponge can be washed with soapy water.	Level 1,2 & 3	<5	(2million or 1million if m/c running for >8hrs/day). 1. Wetter foam edge G0135Ax2 2. Wetter foam centre G0136Ax1	4a-16	
A5	Clean all sensors (both Transmitter and Receiver (if applicable)) with **approved** air dusters. Note, punched arrow indicators on machine to identify sensors.	Level 1,2 & 3	<5	-		
A6	Remove all head covers (external / Internal)	Level 2 & 3	<5	-	3.1.2	
A7	Ensue no pickup problems from loaded pack to empty hopper – run machine in envelope mode only to check for feed problems – refer to appendix items 1-7.	Level 2 & 3	<10	-		
A8	Check Feed tyres for wear and separator gap (Clean/Adjust/Replace if required).	Level 1,2 & 3	<5 <15 (Level 2, 3)	600K 1. Joggler Tyres D0052A*x2 2. Roller C8098A*x4 3. Separator Pads D0051Ax2 * Or replace optional tyres if fitted.	4a-22	
A9	Check rolling backstop rolls down the feed tray.	Level 3	<1	-		

Item #	Maintenance item – Head Unit	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
A10	Check wetting setup and adjustments – run machine in envelope mode only to check wetting.	Level 2 & 3	<10	-	3-15	
A11	Remove envelope feeder A7061A or A7351A. Then check, clean or replace flap grip rollers if not turning freely - no flat spots should be visible. Also check spring action and rollers clear edges of flap plate.	Level 2 & 3	<15	(2million or 1million if m/c running for >8hrs/day). 1. Bearings 6x8x13.8mm E1070Ax2 2. Envelope Shim G6180Ax2 2million 3. Envelope Clutch Shaft Assy A2997Ax1 4. Clutch/Brake Shaft Assy A2998Ax1	4a-20/21	
A12	Check, clean finger assembly - ensure finger bodies are not sticking on the lead screw shaft. Remove from machine if required. Check fingers tips for wear (sharpening) and replace if required.	Level 2 & 3	<20	2million or 1million if m/c running for >8hrs/day). 1. Finger Drives B9320A*x1 2. Finger Operator B9319A*x1 3. Middle finger Extension Drive B7638A*x1. 4. Middle finger extension Operator B7637A*x1. Or replace optional fingers that may be fitted.	4a-24 and 4a-25	
A13	If Brass finger Overguides are fitted – remove and clean. Ensure they rotate freely on the bore. Also check for any distortion and wear.	Level 2 & 3	<10	Replace A/R	4a-39	
A14	Refit envelope feeder.	Level 2 & 3	<5	-		
A15	Check finger stops are adjusted to 0-1mm behind envelope crease line. See appendix 'guidelines for good Insertion' note 10 for instructions. Finger solenoids – clean plungers with dry cloth and use air duster to remove dust. Check and adjust solenoid stroke = 4mm	Level 2 & 3	<10	(2million or 1million if m/c running for >8hrs/day). 1. Finger Solenoid 181-142x2 2. EC25 Clutch pin G0079Ax2 3. Spring G1152Ax2		

Item #	Maintenance item – Head Unit	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
A16	Check envelope stop position is consistent (within 2mm) by running machine in envelope mode only. If the variation is greater then replace the drive clutch and brake on the envelope feed.	Level 2 & 3	<10	(2million or 1million if m/c running for >8hrs/day). 1. EC25 Envelope pickup clutch 181-105UL*x1 2. EC25 Envelope Drive Clutch 181-104*x1 3. EC25 Envelope Drive Brake 181-117*x1 4. EC25 Clutch pin G0079Ax3 * Or replace Long life versions (if fitted) after 2 million - see page 6 for corresponding part numbers.		
A17	Check envelope opener is returning and not sticking - clean the T-bearings and apply light oil. Also clean and oil the t-bearings on the Collate pocket and input rollers.	Level 2 & 3	<5	(2million or 1million if m/c running for >8hrs/day). 1. Opener Assembly A7022A*x1 (2million) 2. T-bearings D1040Ax2 (2million) * Or Curled Flap Opener assembly A7413A (optional only).	4a-30	
A18	Sealer cover assembly (A7046A) – apply oil behind the circlip groove that retains the closer roller bearings P2226A x4.	Level 2 & 3	<10	(2million or 1million if m/c running for >8hrs/day). 1. Sealer Roller Top C8166Ax2 2. Closer bearings P2226Ax4 3. Sealer Roller 40dia C8167Ax1 4. Sealer Roller 25dia C8168Ax1	4a-12	
A19	Wetter solenoids - clean plungers with dry cloth and use air duster to remove dust. Check solenoid stroke = 4mm (down) and 0mm (up).	Level 2 & 3	<5	(2million or 1million if m/c running for >8hrs/day). 1. Solenoid wetter down 181-119x1 2. Solenoid wetter down 181-142x1 3. Solenoid wetter Up 181-142x1 4. EC25 Clutch pin G0079Ax3	4a-17/18	

Item #	Maintenance item – Head Unit	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
A20	**(A5115A) Drive side gears / clutches (applicable to all):** clean idler gears and posts. Apply grease (silicon based) if required. Check gear movement - sideways and rocking (replace gears if required or shim G6028A can be fitted). Check for any tight spots in the drive - especially around the envelope feed path. Check all gear drive pins are intact and not loose. If so, replace gear and pin. This can cause loss of drive and noise problems.	Level 2 & 3	Level 2 <15 Level 3 <30	(2million or 1million if m/c running for >8hrs/day) on A5115A drive side: 1. EC30Pawl track drive clutch 179-214*x1 2. EC30Closer Forward clutch 179-214*x1 3. EC25 Wetter output drive clutch 181-127*x1 4. EC25 Collate entry brake 181-117*x1 5. EC30 clutch pin G0167Ax2 6. EC25 Clutch Pin G0079Ax2 *Or replace Long life versions (if fitted) after 2 million - see page 6 for corresponding part numbers. (2million or 1million if m/c running for >8hrs/day) on A5115A drive side: 1. Gear 48Tx8mm F4151Ax16 2. Gear 30Tx8mm F4156Ax3 3. Gear 25Tx8mm F4152Ax3 4. Gear 40Tx8mm F4150Ax6 5. EC30 Pins P2232Ax6 6. Dowel Pin 3dia x14mm E5071Ax17 7. Dowel Pin 3x8mm E5074Ax12 8. 9.5mm E Clip E5073Ax16 9. Shim G6028Ax10	4a-5	

Item #	Maintenance item – Head Unit	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
A22	Clean main clock disk and ensure there is no excessive movement. Ensure clean from dust / grease.	Level 3	<5	-	4a-5	
A22	Turn pawl chain track by hand and clean with cloth. Also, inspect for any tight spots or damage. Replace if damaged.	Level 3	<15	Only Replace if damaged: 1. Chain ¼" Pitchx61 F6016Ax4 2. Chain ¼" special Link F6041Ax4 Replace after 3 million:- 1. Sprocket 15T F30044AX2, Sprocket Hub P2033AX2 and Pin grooved 2.5diax14mm E5078AX4 assembled. 2. Jockey Sprocket F3004Ax2	4a-2	
A24	Remove and check primary drive assembly. Clean area and ensure all parts are intact (tight spots, belt noise or signs of wear).	Level 2 & 3	<15	(2million or 1million if m/c running for >8hrs/day) on A7068A (220v) or A7069A (110v): 1. Belt 100-S2M-280 F5112Ax1 2. Pulley F1372Ax1 (220v) or F1373Ax1 (110v) 3. 8mm T Bearing D1040Ax4 3million on A7068A or 1.5million if m/c is running >8hrs/day. 1. Pulley 104T F1404Ax1 2. Lenze Clutch 181-128x1 Note: Request Pulley to be assembled onto clutch rotor before shipping.	4a-9	
A25	Remove Sprocket Bracket Assy. A7059A and ensure sprocket turns freely on the spigot. Also lubricate the t-bearings, which holds the sprocket shaft C9264A.	Level 2 & 3	<10	(2million or 1million if m/c running for >8hrs/day). 1. 8mm T Bearing D1040Ax2 2. Jockey Sprocket F3004Ax2	4a-27	

Item #	Maintenance item – Head Unit	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
A26	Check all track transport and drive belts for wear and fit. Clean belts, bobbins in collate input area etc.) with Rubber Roller Restorer (E0483A).	Level 2 & 3	Level 2 <10 Level 3 <20	(2million or 1million if m/c running for >8hrs/day) on A7041A upper clam Assy: 1. 8mm T Bearing D1040Ax6 2. Belt Set 140XL Polyurethane F5119Ax1 3. Lower Belt Set 130XL Polyurethane F5120Ax1 and T bearing D1040Ax2 to be replaced.	4a-10	
A27	Check all head unit screw security (pay particular attention to all handles) – tighten as required. Upgrade to Torx if required.	Level 3	<5	-		
A28	Check sensor cable JST connectors are all properly plugged in. Also check ribbon cables headers (these are more likely to be dislodged).	Level 3	<5	-		
A29	Check collate pocket (A7060A) rollers aligned with rollers in the envelope feeder assy (deskew etc.).	Level 3	<10	2million 1. Feed roller shaft assembly A2993Ax1 2. Insert roller shaft assembly A2994Ax1 (2million or 1million if m/c running for >8hrs/day). 3. 8mm T Bearing D1040Ax4	4a-11	
A30	Clean rollers on the Split Shaft (plain) assy A7064A and Split Shaft (Brake) assy A7063A.	Level 3	<10	2million Notched rollers D0045Ax2	4a-28/29	
A31	Check for squealing noise from clutches. If so, remove and clean and replace if necessary as per A22 & A23.	Level 3	<5	-		
A32	Check envelope side guides for movement, stop position and parallelism to chassis.	Level 3	<1	-		
A33	Check that steel overguide tapes in the insert area are not damaged or distorted.	Level 3	<1	Replace A/R	4a-11	
A34	Check central tape in collate pocket is in tact – replace if required.	Level 3	<1	Replace A/R	4a-11	
A35	Check Polycord belt for damage. Has it stretched? Should not be longer than 930mm. Replace as required.	Level 3	<1	(2million or 1million if m/c running for >8hrs/day). Polycord Belt F0052Ax1		

Item #	Maintenance item – Head Unit	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
A36	Check the Lenze clutch for the collate pocket entry slow – when switched ON in engineer, you should not be able to turn the Polycord drive. If so, check/set the clutch gap – replace the clutch and the clutch disc if required.	Level 3	<5	3million 1. Slow down clutch assy A7366A	4a-5	
A37	Check all clutch pins G0167P or G0079A are intact.	Level 2 & 3	<5	-		
A38	Collate pocket Backstop assembly (A7058A) solenoids – clean plungers with dry cloth and use air duster to remove dust. Ensure collate pocket backstops are working and not sticking. Check solenoid stroke = 4mm	Level 3	<10	(2million or 1million if m/c running for >8hrs/day). 1. Solenoid, Long Stop 181-142x1 2. Solenoid, Short Stop, 181-142x1 3. Clutch Pin G0079Ax2	4a-23	
A39	Engineer Calibrations: Check and adjust (if required) the finger and collate pocket to 210mm.	Level 2 & 3	<5	-		
A40	Go though the Engineer menu to check all Analogue and Digital sensors – calibrate if required.	A/R	<5	Replace sensors A/R		
A41	Go though the Engineer to check all dc motors (collate pocket and fingers).	Level 2 & 3	<5	Replace sensors A/R		
A42	Go through the Engineer menu to check each clutch, brake and solenoid.	A/R	<10	-		
A43	Inspect Module for damage and safety (covers are all intact, interlocks function, warning labels in place).	Level 3	<5	-		
A44	Run ALL customer jobs (if available) and check finger setup, feeding, insertion, wetting and closing.	Level 2 & 3	<30	-		
A45	When all service or repair operations have been carried out, the machine must be left with all parts reassembled, leaving no risk of injury. Complete service log sheet.	Level 2, 3	<5	-		

Times:

Level 1: <30 mins
Level 2: <4hrs
Level 3: <7hrs

Maintenance Schedule – Feeder

Level 1 = Operator level (frequency will depend on usage and applications, but *at least* weekly).
Level 2 = Intermediate Service (frequency usually ½ FULL PM).
Level 3 = FULL PM Service.

Check software versions and implement mandatory updates within TB's and TT's (available on the PFE website).

Item #	Maintenance item – Insert Feeder	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
B1	Clean all paper transport rollers using water or recommended cleaning fluid. Check joggler tyres (if fitted) for alignment.	Level 1,2 & 3	<5	-		
B2	Clean all sensors with **approved** air dusters.	Level 1,2 & 3	<5	-		
B3	Remove Feeder covers (external / internal).	Level 2 & 3	<1	-		
B4	Vacuum clean to remove internal dust. Clean all covers.	Level 3	<5	-		
B5	Check for pickup problems from loaded pack to empty hopper by running machine.	Level 2 & 3	<10	-		
B6	Check Feed tyres for wear and separator gap. A7032A Insert Separator assembly and Feed Shaft Assembly A7030A. (Clean/Adjust/Replace if required).	Level 3	<5	600K 1. Roller C8098A*x4 2. Separator Pads D0051Ax2 * Or replace optional tyres if fitted.	3-6	
B7	Clean all T bearings (note, can apply light oil and clean off any excess) in the Paper Transport Assembly (A7033A).	Level 2 & 3	Level 2 <5 Level 3 <15	(2million or 1million if m/c running for >8hrs/day). 1. 8mm T Bearing D1040Ax4. 2 million: 2. Upper transport roller shaft assembly A2793A. 3. Upper Transport Roller Shaft Assy A2792A. 4. Transport roller shaft assembly A2791A. 5. Eject Shaft roller Assy A2790A.	4b-9	

Item #	Maintenance item – Head Unit	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
B8	Check, clean and ensure free turning of the bearings on the out feed body assy (A7034A).	Level 2 & 3	<5	-	4b-6	
B9	**Drive side gears / clutches (applicable to all):** Remove/clean idler gears and posts. Apply grease (silicon based) if required. Check gear movement - sideways and rocking (replace gears if required). Check for any tight spots in the drive. Check all gear drive pins are in tact and not loose. If so, replace gear and pin. This can cause loss of drive and noise problems.	Level 3	Level 2 <15 Level 3 <30	2million Gears: Replace A/R. It is advised to keep stock of F4150Ax2, F4151Ax2 and F4152Ax2. (2million or 1million if m/c running for >8hrs/day). 1. Separator Clutch 181-117x1 2. Track control clutch 181-127x1 3. Main Paper Transport clutch 181-127*x1 4. Clutch Pin G0079Ax3 *Or replace Long life versions (if fitted) after 2 million - see page 6 for corresponding part numbers.	4b-3	
B10	**Operator side gears / clutches (applicable to all):** clean idler gears and posts. Apply grease (silicon based) if required. Check gear movement - sideways and rocking (replace gears if required). Check for any tight spots in the drive. Check all gear drive pins are in tact and not loose. If so, replace gear and pin. This can cause loss of drive and noise problems.	Level 3	<15	2million Gears: Replace A/R It is advised to keep stock of F4150Ax2, F4151Ax2 and F4152Ax2. (2million or 1million if m/c running for >8hrs/day). 1. Track control Brake 181-127*x1 2. Main Paper Transport Brake 181-127x1 3. Clutch Pin G0079Ax2 *Or replace Long life versions (if fitted) after 2 million - see page 6 for corresponding part numbers.	4b-3	

Item #	Maintenance item – Head Unit	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
B11	Remove and check motor assembly (A7039A). Clean area and ensure all parts are intact (tight spots, belt noise or signs of wear). Clean clock disk on the motor assembly. Check motor pulley is tight on the motor shaft.	Level 3	<5	(2million or 1million if m/c running for >8hrs/day). 1. Motor Pulley F1372A (220v) or F1373A (110v)	4b-6	
B12	Remove Lower conveyor (A7036A) and check all track transport and drive belts for wear and fit. Clean belts, and ensure the drive is free to rotate - area etc.) with Rubber Roller Restorer (E0483A).	Level 3	<15	(2million or 1million if m/c running for >8hrs/day). 1. Belt 330XL F5122A (1set) 2. 8mm T bearing D1040Ax4	4b-8	
B13	Remove Upper conveyor (A7035A) and check all track transport and drive belts for wear and fit. Clean belts (with Rubber Roller Restorer E0483A) and ensure the main drive shaft C9259A is free to rotate.	Level 3	<15	(2million or 1million if m/c running for >8hrs/day). 1. Belt 330XL F5121A (1set) 2. 8mm T bearing D1040Ax6 2million It is advised to keep stock of F4150Ax2, F4151Ax2 and F4235Ax1.	4b-7	
B14	Check for any tight spots in the main drive and belt tension.	Level 3	<10	2million Belt 100-S2M F5113Ax1		
B15	Check all unit screw security (pay particular attention to all handles) – tighten as required. Tighten Latch handle C3561E and ensure assembly opens and latches.	Level 3	<5	-		
B16	Check sensor cable JST connectors are all properly plugged in. Also check ribbon cables headers (these are more likely to be dislodged).	Level 3	<5	-		
B17	Check for squealing noise from clutches. If so, remove and clean and replace if necessary.	Level 3	<5	Ref B11 and B12.		
B18	Check side guides for movement, stop position and parallelism to chassis. Ensure side guides retaining screws are tight.	Level 3	<1			
B19	Check rolling backstop rolls down the feed tray.	Level 3	<1	-		
B20	Check all clutch pins G0167P or G0079A are intact.	Level 3	<5	Replace A/R		
B21	Go though the Engineer menu to check all Analogue and Digital sensors – calibrate if required.	A/R	<5	Replace A/R		
B22	Go through the Engineer menu to check each clutch, brake and solenoid.	A/R	<10	Replace A/R		

Item #	Maintenance item – Head Unit	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
B23	Inspect Module for damage and safety (covers are all intact, interlocks function, warning labels in place).	Level 2 & 3	<5	-		
B24	When all service or repair operations have been carried out, the machine must be left with all parts reassembled, leaving no risk of injury. Complete service log sheet.	Level 2, 3	<5	-		

Times:
Level 1: <10 mins
Level 2: <40 mins
Level 3: <3 hrs

Maintenance Schedule – Tower Feeder

Level 1 = Operator level (frequency will depend on usage and applications, but *at least* weekly).
Level 2 = Intermediate Service (frequency usually ½ FULL PM).
Level 3 = FULL PM Service.

Check software versions and implement mandatory updates within TB's and TT's (available on the PFE website).

Item #	Maintenance item – Tower Feeder	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
B1	Clean all paper transport rollers using water or recommended cleaning fluid. Check joggler tyres (if fitted) for alignment.	Level 1,2 & 3	<5	-		
B2	Clean all sensors with **approved** air dusters.	Level 1,2 & 3	<5	-		
B3	Remove Feeder covers (external / internal).	Level 2 & 3	<1	-		
B4	Vacuum clean to remove internal dust. Clean all covers.	Level 3	<5	-		
B5	Check for pickup problems from loaded pack to empty hopper by running machine.	Level 2 & 3	<10	-		
B6	Check Feed tyres for wear and separator gap. A7032A Insert Separator assembly and Feed Shaft Assembly A7030A. (Clean/Adjust/Replace if required).	Level 3	<5	600K 1. Roller C8098A*x4 2. Separator Pads D0051Ax2 * Or replace optional tyres if fitted.	3-6	
B7	Tower Feeder Assembly A5135A (Part 1) – page 4b-11 Clean all T bearings and rollers (note, can apply light oil and clean off any excess).	Level 2 & 3	<5	(2million or 1million if m/c running for >8hrs/day). 1. 8mm T Bearing D1040Ax4 2million 2. Transport Shaft Assy A7236Ax2 3. Lower Fdr Roller Assy A7235A	4b-11	

Item #	Maintenance item – Head Unit	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
B8	Tower Feeder Assembly A5135A (Part 2) – page 4b-12 Clean all T bearings and rollers (note, can apply light oil and clean off any excess).	Level 2 & 3	<5	(2million or 1million if m/c running for >8hrs/day). 1. 8mm T Bearing D1040Ax2 2million 2. Eject shaft Assy A7234A 3. Clutch brake shaft assy A7237A	4b-12	
	Check, clean and ensure free turning of the bearings on the out feed body assy (A7034A).	Level 2 & 3	<5	-	4b-6	
B9	Clean all T-bearings on the Access Assy. A7228A. Apply light oil and clean off any excess.	Level 3	<10	(2million or 1million if m/c running for >8hrs/day). 8mm T Bearing D1040Ax6 2million Tower Access shaft assy A2845Ax3	4b-15	
B10	Clean all T-bearings on the Insert Direction Roller Assy. A7229A. Apply light oil and clean off any excess.	Level 3	<10	(2million or 1million if m/c running for >8hrs/day). 8mm T Bearing D1040Ax4 Feed wheel tyre D0038Ax4 2million Upper transport roller shaft assy A2792A	4b-16	
B11	Remove Transport Roller Assy. A7231A from **Tower Feeder** and clean all T-bearings. Apply light oil and clean off any excess.	Level 3	<10	(2million or 1million if m/c running for >8hrs/day). 1. 8mm T Bearing D1040Ax2 2million 2. Transport shaft upper assy A7232A 3. Transport shaft lower assy A7233A	4b-17	
B12	Remove Insert Deflector Assy. A7230A from **Tower Feeder** and clean paper deflector extrusion (ensure extrusion surface is free from damage). Ensure the directions rollers turn freely.	Level 3	<10	-	4b-18	

Item #	Maintenance item – Head Unit	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
B13	**Drive side gears / clutches A5135A (Part 1):** clean idler gears and posts. Apply grease (silicon based) if required. Check gear movement - sideways and rocking (replace gears if required). Check for any tight spots in the drive. Check all gear drive pins are in tact and not loose. If so, replace gear and pin. This can cause loss of drive and noise problems.	Level 3	<30	2million Gears: Replace A/R. It is advised to keep stock of 40T F4150Ax2, 48T F4151Ax2, 25T F4152Ax2, 30T F4156Ax1and 32T F4235Ax1. (2million or 1million if m/c running for >8hrs/day). 1. EC30 Clutch Track Feed 179-214*x1 2. Clutch Pickup posn 1 181-117*x1 3. Clutch Pickup posn 2 181-117*x1 4. Clutch deskew posn 1 181-127*x1 5. Clutch deskew posn 2 181-127*x1 6. Clutch Track Control 181-127*x1 7. Clutch pin G0079Ax5 8. EC30 clutch pin G0167Px1 *Or replace Long life versions (if fitted) after 2 million - see page 6 for corresponding part numbers.	4b-11	
B14	**Operator side clutches A5135 (Part 2):**	Level 3	<15	(2million or 1million if m/c running for >8hrs/day). 1. Deskew Brake 181-127*x1 2. Track Control Brake 181-127*x1 3. ECD30Track feed brake 179-214*x1 4. Deskew brake 181-105UL*x1 5. Clutch pin G0079Ax3 6. EC30 clutch pin G0167Px1 *Or replace Long life versions (if fitted) after 2 million - see page 6 for corresponding part numbers.	4b-12	
B16	Remove and check motor assembly. Clean area and ensure all parts are intact (tight spots, belt noise or signs of wear). Clean clock disk on the motor assembly. Check motor pulley is tight on the motor shaft.	Level 3	<5	3million 1. Motor Pulley F1372A (220v) or F1373A (110v)	4b-6	

Item #	Maintenance item – Head Unit	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
B17	Remove Lower conveyor and check all track transport and drive belts for wear and fit. Clean belts, bobbins in collate input area etc.) with Rubber Roller Restorer (E0483A).	Level 3	<15	(2million or 1million if m/c running for >8hrs/day). 1. Belt 330XL F5122A (1set) 2. 8mm T bearing D1040Ax4	4b-8	
B18	Remove Upper conveyor and check all track transport and drive belts for wear and fit. Clean belts, bobbins in collate input area etc.) with Rubber Roller Restorer (E0483A).	Level 3	<15	(2million or 1million if m/c running for >8hrs/day). 1. Belt 330XL F5121A (1set) 2. 8mm T bearing D1040Ax6 2million Gears: Replace A/R. It is advised to keep stock of F4150Ax2, F4151Ax2 and F4235Ax1.	4b-7	
B19	Check for any tight spots in the drive and belt tension.	Level 3	<10	2million Belt 100-S2M F5151A		
B20	Check all unit screw security (pay particular attention to all handles) - tighten as required. Tighten Latch handle C3561E and ensure assembly opens and latches.	Level 3	<5	-		
B21	Check sensor cable JST connectors are all properly plugged in. Also check ribbon cables headers (these are more likely to be dislodged).	Level 3	<5	-		
B22	Check for squealing noise from clutches. If so, remove and clean and replace if necessary (ref B11 and B12).	Level 3	<5	Ref B11 and B12.		
B23	Check side guides for movement, stop position and parallelism to chassis. Ensure side guides retaining screws are tight.	Level 3	<1	-		
B26	Check rolling backstop rolls down the feed tray.	Level 3	<1	-		
B27	Check all clutch pins G0167P or G0079A are intact.	Level 3	<5	Replace A/R		
B28	Go though the Engineer menu to check all Analogue and Digital sensors – calibrate if required.	A/R	<5	Replace A/R		
B29	Go through the Engineer menu to check each clutch, brake and solenoid.	A/R	<10	Replace A/R		

Item #	Maintenance item – Head Unit	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
B30	Inspect Module for damage and safety (covers are all intact, interlocks function, warning labels in place).	Level 2 & 3	<5			
B31	When all service or repair operations have been carried out, the machine must be left with all parts reassembled, leaving no risk of injury. Complete service log sheet.	Level 2, 3	<5			

Times:

Level 1: <10 mins
Level 2: <1 hrs
Level 3: <4 hrs

Maintenance Schedule – Mark Reading Feeder

Level 1 = Operator level (frequency will depend on usage and applications, but *at least* weekly).
Level 2 = Intermediate Service (frequency usually ½ FULL PM).
Level 3 = FULL PM Service.

Check software versions and implement mandatory updates within TB's and TT's (available on the PFE website).

Item #	Maintenance item – Mark Reading Feeder	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
B1	Clean all paper transport rollers using water or recommended cleaning fluid. Check joggler tyres (if fitted) for alignment.	Level 1,2 & 3	<5	-		
B2	Clean all sensors with **approved** air dusters.	Level 1,2 & 3	<5	-		
B3	Remove Feeder covers (external / internal).	Level 2 & 3	<1	-		
B4	Vacuum clean to remove internal dust. Clean all covers.	Level 3	<5	-		
B5	Check for pickup problems from loaded pack to empty hopper by running machine.	Level 2 & 3	<10	-		
B6	Check Feed tyres for wear and separator gap. A7032A Insert Separator assembly and Feed Shaft Assembly A7030A. (Clean/Adjust/Replace if required).	Level 3	<5	600K 1. Roller C8098A*x4 2. Separator Pads D0051Ax2 * Or replace optional tyres if fitted.	3-6	
B7	Clean all T bearings (note, can apply light oil and clean off any excess) in the OMR Eject Roller Carrier A7344A.	Level 2 & 3	<5	(2million or 1million if m/c running for >8hrs/day). 1. 8mm T Bearing D1040Ax4 2 million on A7344A: 2. Upper transport roller shaft assembly A2793A. 3. Upper Transport Roller Shaft Assy A2792A. Others shafts include 4. Lower Transport shaft assy A7340A 5. Middle Transport shaft assembly A7347A. 6. Eject Shaft roller Assy A2790A.	4b-9	

Item #	Maintenance item – Head Unit	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
B8	Clean all T bearings (note, can apply light oil and clean off any excess) in the OMR Transport Roller Assy A7345A or Barcode Transport Roller Assy A7346A.			(2million or 1million if m/c running for >8hrs/day). 1. 8mm T Bearing D1040Ax2. 3million 2. Upper Transport Shaft A7337A for OMR or A7339A for Barcode.	4b-50	
B9	Check, clean and ensure free turning of the bearings on the out feed body assy (A7034A).	Level 2 & 3	<5	-	4b-6	
B10	**Drive side gears / clutches (applicable to all):** Remove/clean idler gears and posts. Apply grease (silicon based) if required. Check gear movement - sideways and rocking (replace gears if required). Check for any tight spots in the drive. Check all gear drive pins are in tact and not loose. If so, replace gear and pin. This can cause loss of drive and noise problems.	Level 3	<30	2million Gears: Replace A/R. It is advised to keep stock of F4150Ax2, F4151Ax2 and F4152Ax1. (2million or 1million if m/c running for >8hrs/day). 1. Pickup Clutch 181-117*x1 2. Deskew Clutch 181-127*x1 3. Track Feed Clutch 181-127*x1 4. Track Clutch 181-127*x1 5. Clutch Pin G0079Ax4 *Or replace Long life versions (if fitted) after 2 million - see page 6 for corresponding part numbers.	4b-3 or 4b-12	

Item #	Maintenance item – Head Unit	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
B11	**Operator side gears / clutches (applicable to all):** clean idler gears and posts. Apply grease (silicon based) if required. Check gear movement - sideways and rocking (replace gears if required). Check for any tight spots in the drive. Check all gear drive pins are in tact and not loose. If so, replace gear and pin. This can cause loss of drive and noise problems.	Level 3	<15	(2million or 1million if m/c running for >8hrs/day). 1. Deskew Brake 181-127*x1 2. Track feed brake 181-127*x1 3. Track brake 181-127*x1 4. Clutch Pin G0079Ax3 *Or replace Long life versions (if fitted) after 2 million - see page 6 for corresponding part numbers.	4b-3 or 4b-12	
B12	Remove and check motor assembly (A7039A). Clean area and ensure all parts are intact (tight spots, belt noise or signs of wear). Clean clock disk on the motor assembly. Check motor pulley is tight on the motor shaft.	Level 3	<5	2million 1. Motor Pulley F1372A (220v) or F1373A (110v)	4b-6	
B13	Remove Lower conveyor (A7036A) and check all track transport and drive belts for wear and fit. Clean belts, and ensure the drive is free to rotate - area etc.) with Rubber Roller Restorer (E0483A).	Level 3	<15	(2million or 1million if m/c running for >8hrs/day). 1. Belt 330XL F5122A (1set) 2. 8mm T bearing D1040Ax4	4b-8	
B14	Remove Upper conveyor (A7035A) and check all track transport and drive belts for wear and fit. Clean belts (with PFE cleaning fluid) and ensure the main drive shaft C9259A is free to rotate.	Level 3	<15	(2million or 1million if m/c running for >8hrs/day). 1. Belt 330XL F5121A (1set) 2. 8mm T bearing D1040Ax6 2million It is advised to keep stock of F4150Ax2, F4151Ax2 and F4235Ax1.	4b-7	
B15	Check for any tight spots in the main drive and belt tension.	Level 3	<10	2million Belt 100-S2M F5113Ax1		
B16	Check all unit screw security (pay particular attention to all handles) – tighten as required. Tighten Latch handle C3561E and ensure assembly opens and latches.	Level 3	<5	-		
B17	Check sensor cable JST connectors are all properly plugged in. Also check ribbon cables headers (these are more likely to be dislodged).	Level 3	<5	-		
B18	Check for squealing noise from clutches. If so, remove and clean and replace if necessary.	Level 3	<5	Replace A/R as per B11 and B12.		

Item #	Maintenance item – Head Unit	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
B19	Check side guides for movement, stop position and parallelism to chassis. Ensure side guides retaining screws are tight.	Level 3	<1			
B20	Check rolling backstop rolls down the feed tray.	Level 3	<1	-		
B21	Check all clutch pins G0167P or G0079A are intact.	Level 3	<5	Replace A/R		
B22	Go though the Engineer menu to check all Analogue and Digital sensors – calibrate if required.	A/R	<5	Replace A/R		
B23	Go through the Engineer menu to check each clutch, brake and solenoid.	A/R	<10	Replace A/R		
B24	Inspect Module for damage and safety (covers are all intact, interlocks function, warning labels in place).	Level 2 & 3	<5	-		
B25	When all service or repair operations have been carried out, the machine must be left with all parts reassembled, leaving no risk of injury. Complete service log sheet.	Level 2, 3	<5	-		

Maintenance Schedule – 2 Plate Folder module

Level 1 = Operator level (frequency will depend on usage and applications).
Level 2 = Intermediate Service (frequency usually ½ FULL PM).
Level 3 = FULL PM Service

Check software versions and implement mandatory updates within TB's and TT's (available on the PFE website).

Item #	Maintenance item – 2 Folder Module	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
C1	Clean all paper transport rollers using water or recommended cleaning fluid. Check joggler tyres (if fitted) for alignment.	Level 1,2 & 3	<5	-		
C2	Clean all sensors with **approved** air dusters.	Level 1,2 & 3	<5	-		
C3	Remove Folder covers.	Level 2 & 3	<1	-		
C4	Vacuum clean to remove internal dust. Clean all covers.	Level 3	<5	-		
C5	Check for pickup problems from loaded pack to empty hopper by running machine.	Level 2 & 3	<10	600K 2 Plate Folder Pickup Shaft Assy A7095A 2 Plate Folder Separator Shaft Assy A7096A Plate Folder Separator Shaft Assy A7096A Infeed restrictor cork G0152Ax2 (2million or 1million if m/c running for >8hrs/day). Separator Pickup Clutch 181-117*x1. Separator Pad G0154Ax1 *Or replace Long life versions (if fitted) after 2 million - see page 6 for corresponding part numbers.		
C6	Inspect Module for damage and safety (covers are all intact, interlocks function, warning labels in place).	Level 3	<5	-		

Item #	Maintenance item – Head Unit	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
C7	Clean all T-bearings on the 2 Plate Folder Transport Shaft Assy A2843A. Apply light oil and clean off any excess.	Level 2 & 3	<5	(2million or 1million if m/c running for >8hrs/day). 1. 8mm T bearing D1040Ax2 (1million) 3million 1. Paper Transport Shaft Assy A2843AX2	4b-28	
C8	***********This is Mandatory @ every level 2 and 3 Service********** **2 Plate Folder Roller Assy A7194A. Clean and apply Silicon-based grease onto the bore of the T-bearings.**	Level 2 & 3	<5	(2million or 1million if m/c running for >8hrs/day). 8mm T bearing D1040Ax6 2million 1. Spring Heavy pressure G1117Ax6 2. Gear 30Tx8mm F4156Ax2 3. Gear 25Tx8mm F4152Ax3	4b-30	
C9	Clean all T-bearings 2 Plate Folder Eject Roller Carrier Assy A7290A. Apply light oil and clean off any excess.	Level 2 & 3	<5	(2million or 1million if m/c running for >8hrs/day). 8mm T bearing D1040Ax4 2million Upper Transport Roller Shaft Assy A2792Ax2.	4b-31	
C10	Plate Folder Paper Direction Roller A7176A	Level 3	<5	(2million or 1million if m/c running for >8hrs/day). Paper Transport Clutch 181-127*x1 Paper transport Brake 181-127*x1 *Or replace Long life versions (if fitted) after 2 million - see page 6 for corresponding part numbers. 3million Plate Folder Paper Direction Roller A7176A		
C11	Check, clean and ensure free turning of the bearings on the 2 Plate Folder Outfeed Body Assy. A7034A	Level 3	<5	-	4b-33	

Item #	Maintenance item – Head Unit	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
C12	Remove 2 Plate Folder Fold Box Assembly A7193A from machine and check travel of fold plate 1 and 2 backstops. Clean fold plate belts and ensure they are held within the slider (tighten as required). Oil brass slider and clean off any excess.	Level 3	<5	-	4b-37	
C13	**Drive side gears / clutches (applicable to all):** clean idler gears and posts. Apply grease (silicon based) if required. Check gear movement - sideways and rocking (replace gears if required). Check for any tight spots in the drive. Check all gear drive pins are in tact and not loose. If so, replace gear and pin. This can cause loss of drive and noise problems.	Level 3	<30	2million Gears: Replace A/R. It is advised to keep stock of F4150Ax2, F4151Ax2 and F4156Ax1. (2million or 1million if m/c running for >8hrs/day). Clutches: 1. Track Control clutch 181-127*x1 2. Clutch Pin G0079Ax1	4b-23	
C14	**Operator side gears / clutches (applicable to all):** clean idler gears and posts. Apply grease (silicon based) if required. Check gear movement - sideways and rocking (replace gears if required). Check for any tight spots in the drive. Check all gear drive pins are in tact and not loose. If so, replace gear and pin. This can cause loss of drive and noise problems.	Level 3	<15	2million Gears: Replace A/R (2million). It is advised to keep stock of F4150Ax1 (2million or 1million if m/c running for >8hrs/day). 1. Track Control brake 181-127*x1 2. Clutch Pin G0079Ax1	4b-24	
C15	Remove and check motor assembly. Clean area and ensure all parts are intact (tight spots, belt noise or signs of wear). Clean clock disk on the motor assembly. Check motor pulley is tight on the motor shaft.	Level 3	<5	-	4b-34	
C16	Remove Lower conveyor (A7036A) and check all track transport and drive belts for wear and fit. Clean belts, and ensure the drive is free to rotate - area etc.) with Rubber Roller Restorer (E0483A).	Level 3	<15	(2million or 1million if m/c running for >8hrs/day). 1. Belt 330XL F5122A (1set) 2. 8mm T bearing D1040Ax4	4b-36	

Item #	Maintenance item – Head Unit	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
C17	Remove Upper conveyor (A7035A) and check all track transport and drive belts for wear and fit. Clean belts (with Rubber Roller Restorer) and ensure the main drive shaft C9259A is free to rotate.	Level 3	<15	(2million or 1million if m/c running for >8hrs/day). 1. Belt 330XL F5121A (1set) 2. 8mm T bearing D1040Ax6 2million Gears: Replace A/R. It is advised to keep stock of F4150Ax2, F4151Ax2 and F4235Ax1.	4b-36	
C18	Clean rollers on Folder Eject Shaft Assemblies A7201A/A2790A. Clean gears and apply grease (silicon based) if required. Check gear movement - sideways and rocking (replace gears if required).	Level 3	<15	2million: Gears: Replace A/R (2million). It is advised to keep stock of F4150Ax1, F4156A and F4152Ax1. (2million or 1million if m/c running for >8hrs/day). Track Feed Clutch 181-12*x1 Track feed brake 181-127*x1 *Or replace Long life versions (if fitted) after 2 million - see page 6 for corresponding part numbers. 3 million Eject shaft assy A2790A Eject shaft assy A2701A	4b-32	
C20	With ALL parts re-assembled - Check for any tight spots in the drive and belt tension – re-tension main drive belt.	Level 3	<5	-		
C21	Check all side guides for movement (feed trays and accumulator), stop position and parallelism to chassis.	Level 3	<5	-		
C23	Check all clutch pins G0167P or G0079A are intact.	Level 3	<5	Replace A/R		
C24	Check all unit screw security (pay particular attention to all handles) – tighten as required.	Level 3	<5	-		
C25	Check sensor cable JST connectors are all properly plugged in. Also check ribbon cables headers (these are more likely to be dislodged).	Level 3	<5	-		

Item #	Maintenance item – Head Unit	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
C26	Check for squealing noise from clutches. If so, remove and clean and replace if necessary.	Level 3	<5	Replace A/R		
C27	Check all restraint straps are intact - replace if required.	Level 3	<5	Replace A/R		
C28	Go though the Engineer menu to check all Analogue and Digital sensors – calibrate if required.	A/R	<5	Replace A/R		
C29	Go through the Engineer menu to check each clutch, brake and solenoid.	A/R	<10	Replace A/R		
C30	Check and adjust (if required) fold lengths (in 'View Fold Settings' for Maxi or Module Options/ Fold Plate Lengths in Maxi+).	Level 3	<5	-		
C31	Check and adjust (if required) the collation of forms in the engineer window.	Level 3	<5	-		
C32	When all service or repair operations have been carried out, the machine must be left with all parts reassembled, leaving no risk of injury. Complete service log sheet.	Level 2, 3	<5	-		

Times:
Level 1: <20 mins
Level 2: <1 hrs
Level 3: <4 hrs

Maintenance Schedule – 3 Plate Folder module

Level 1 = Operator level (frequency will depend on usage and applications, but *at least* weekly).
Level 2 = Intermediate Service (frequency usually ½ FULL PM).
Level 3 = FULL PM Service.

Check software versions and implement mandatory updates within TB's and TT's (available on the PFE website).

Item #	Maintenance item – 3 Folder Module	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
C1	Clean all paper transport rollers using water or recommended cleaning fluid. Check joggler tyres (if fitted) for alignment.	Level 1,2 & 3	<5	-		
C2	Clean all sensors with **approved** air dusters.	Level 1,2 & 3	<5	-		
C3	Remove Folder covers.	Level 2 & 3	<1	-		
C4	Vacuum clean to remove internal dust. Clean all covers.	Level 3	<5			
C5	Check for pickup problems from loaded pack to empty hopper by running machine. Other things to check for include doubles, streaming etc.. Check Separator Gap and adjust accordingly.	Level 2 & 3	<10	600K 1. Pickup Shaft Assy A7095Ax3 2. Separator Shaft Assy A7096Ax3 3. Separator Assy A7097Ax3 4. Infeed Restrictor Cork G0152Ax2 (2million or 1million if m/c running for >8hrs/day). 1. Separator Pickup Clutch 181-117* *Or replace Long life versions (if fitted) after 2 million - see page 6 for corresponding part numbers.	4c-40, 4c-41, 4c-42	
C6	Inspect Module for damage and safety (covers are all intact, interlocks function, warning labels in place).	Level 3	<5	-		

Item #	Maintenance item – Head Unit	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
C7	**3 Station Tower Access Assy. A7091A or A7092A**	Level 2 & 3	<15	(2million or 1million if m/c running for >8hrs/day). 1. 8mm T bearing D1040Ax4 or x2. 2million 1. Tower access shaft assembly A2845Ax2 or x1.	4c-34 or 35	
C8	**3 Plate folder Tower Assy** - **Applicable on all feed stations.** Clean rollers and T bearings. **Clean Folder Paper Direction Roller A7176A.** Remove and clean paper deflector C7636A and or C7401A. Then check and adjust gaps (if required) between paper deflector C7636A and rollers – 3 sheets (80gsm paper).	Level 2 & 3	<20	(2million or 1million if m/c running for >8hrs/day). 1. 8mm T bearing D1040Ax4 or x2. 2. Collate clutch 181-127x3 3. Collate Brake 181-127x3 4. Gears: Replace gears A/R. It is advised to keep stock of F4150Ax2 and F4156Ax2. 2million 1. Paper Transport Shaft Assy A2843AX2 4million 1. Plate Folder Paper Direction Roller A7176Ax3	4c-39, 4c-30 to 33	
C9	**3 Plate folder Tower Assy with OMR fitted.** Clean rollers and T bearings.	Level 2 & 3	<10	(2million or 1million if m/c running for >8hrs/day). 1. 8mm T bearing D1040Ax4 or x2. 2million 1. Paper Transport Shaft Assy A2843A 2. OMR paper Transport Assy A2844A		
C10	**Clean rollers in the Collate Jam Access Assy. A7054A**	Level 2 & 3	<10	2million 1. Drive Shaft Jam Access Assy A2849A 2. Drive Shaft Collation Assy A2851A	4c-16	

Item #	Maintenance item – Head Unit	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
C11	**1 Station or 3 station Tower Drive side gears (applicable to all):** clean idler gears and posts. Apply grease (silicon based) if required. Check gear movement - sideways and rocking (replace gears if required). Check for any tight spots in the drive. Check all gear drive pins are in tact and not loose. If so, replace gear and pin. This can cause loss of drive and noise problems.	Level 3	<30	(2million or 1million if m/c running for >8hrs/day). 1. Gears: Replace A/R. It is advised to keep stock of F4150Ax2 and F4151Ax2 2. Track Control clutch 181-127*x1 3. Clutch Pin G0079Ax1	4c-28/29	
C12	**Operator side Clutches (applicable to all)**.	Level 3	<15	(2million or 1million if m/c running for >8hrs/day). 1. Track Control brake 181-127*x1 or 3 2. Clutch Pin G0079Ax1 or 3 *Or replace Long life versions (if fitted) after 2 million - see page 6 for corresponding part numbers.	4c30-33	
C13	Remove and check motor assembly A7084A or A7085A. Clean area and ensure all parts are intact (tight spots, belt noise or signs of wear). Clean clock disk on the motor assembly. Check motor pulley is tight on the motor shaft.	Level 3	<5	-	4c-19	

Item #	Maintenance item – Head Unit	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
C14	Clean rollers on Eject Shaft Assy A7079A and Eject drive shaft assy A7080A. Clean gears and apply grease (silicon based) if required. Check gear movement - sideways and rocking (replace gears if required).	Level 3	<5	(2million or 1million if m/c running for >8hrs/day). 1. Gears: Replace A/R. It is advised to keep stock of F4150Ax1, F4156A and F4152Ax1. 2. Track Feed Clutch 181-127* 3. Track feed brake 181-127* *Or replace Long life versions (if fitted) after 2 million - see page 6 for corresponding part numbers. 2million Other parts:- Eject shaft assy A7079A Eject shaft assy A7080A	4c2, 4c23-24	
C15	**Remove Divert tray (if Fitted)**	Level 3	<1	-		
C16	**Remove Overguide Assy. A7117A** Clean all T-bearings. Apply light oil and clean off any excess. Clean / check belt condition. Replace if required.	Level 3	<5	(2million or 1million if m/c running for >8hrs/day). 1. 8mm T bearing D1040Ax2 2. Timing belt F5136A (1set) 3. Accumulator belts clutch 181-117* 4. Clutch Pin G0079A *Or replace Long life versions (if fitted) after 2 million - see page 6 for corresponding part numbers.	4c-14	

Item #	Maintenance item – Head Unit	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
C17	Remove Accumulator assembly A7118A (if fitted). Clean all T-bearings and check belt/pawl condition and replace if required. Check pawl are alignment using a sheet of paper. Check pulley and belt condition on the accumulator stepper motor. Accumulator Gate solenoids – clean plungers with dry cloth and use air duster to remove dust. Check and adjust solenoid stroke = 4mm. Check when the solenoid is pulled in (by hand) that the gate clears the paper path. Tower accumulator bracket idler wheel assembly B4376A - Clean and lubricate brass bearings.	Level 3	<5	(2million or 1million if m/c running for >8hrs/day). 1. 8mm T bearing D1040Ax2 2. Solenoid 181-119x1 2million 1. Belt 384XL F5137A (set) 2. Belt 100 S2M F5124Ax1 If divert is fitted, 3. Bracket Idler wheel assy B4376A Transport roller D0044Ax2	4c-11	
C18	**Remove Fold Plate 2 Assy A7078A:** Check travel of backstops. Clean fold plate belts and ensure they are held within the slider (tighten as required). Clean No-Fold beam and ensure it dies not stick when pushed by the backstops (by hand). Oil brass slider and clean off any excess.	Level 3	<5	-	4c-10	
C19	**Remove Fold Plates 1 & 3 Assy. A7044A:** Check travel of fold plate 1 and 3 backstops. Clean fold plate belts and ensure they are held within the slider (tighten as required). Clean No-Fold beam and ensure it dies not stick when pushed by the backstops (by hand). Oil brass slider and clean off any excess.	Level 3	<5	-	4c-8	
C20	Check, clean and ensure free turning of the bearings on the paper guide assembly (A7087A).	Level 3	<5	-	4c-17	
C21	Clean all T-bearings on the Eject Roller Carrier Assy. A7075A (note, can apply light oil and clean off any excess).	Level 3	<5	(2million or 1million if m/c running for >8hrs/day). 1. 8mm T bearing D1040Ax2 2. Eject Roller Shaft Assy A2894Ax2	4c-5	
C22	**Remove Folder Jam Access Assy. A7077A.** Clean all T-bearings. Apply light oil and clean off any excess. Clean gears and posts. Apply grease (silicon based) if required. Check gear movement - sideways and rocking (replace gears if required). Check for any tight spots in the drive. Check all gear drive pins are in tact and not loose. If so, replace gear and pin. This can cause loss of drive and noise problems.	Level 3	<15	(2million or 1million if m/c running for >8hrs/day). 1. 8mm T bearing D1040Ax4 2. Gears: Replace A/R. It is advised to keep stock of F4151Ax1 and F4150A 3. Rollers D0021Ax8	4c-6	

Item #	Maintenance item – Head Unit	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
C23	**Folder Base Assembly A5116A:** Clean all T-bearings. Apply light oil and clean off any excess. Clean all rollers on the following areas: 1. Collate jam access A7054A 2. Idler shaft collation deskew A2852A 3. Eject shaft C/B assy A7079A 4. Eject drive shaft assy A7080A 5. Roller Fold Rollers C8175Ax3 Clean gears and posts. Apply grease (silicon based) if required. Check gear movement - sideways and rocking (replace gears if required). Check for any tight spots in the drive. Check all gear drive pins are in tact and not loose. If so, replace gear and pin. This can cause loss of drive and noise problems. Divert solenoids – clean plungers with dry cloth and use air duster to remove dust. Check and adjust solenoid stroke = 4mm. Check for squealing noise from clutches. If so, remove and clean and replace if necessary. Check for any tight spots in the drive and belt tension – re-tension main drive belt. Check Lenze clutch is set with the correct gap and is not binding or slipping.	Level 3	<30	<u>(2million or 1million if m/c running for >8hrs/day).</u> 1. 8mm T bearing D1040Ax2 2. Fold entry brake 181-127* 3. Track exit brake 181-127* 4. Folder entry clutch 181-127* 5. Folder exit clutch 181-127* 6. Divert Solenoid 181-119 *Or replace Long life versions (if fitted) after 2 million - see page 6 for corresponding part numbers. <u>2million</u> 1. Gears: Replace A/R. It is advised to keep stock of F4152Ax1, F4156Ax3, F4150Ax4 and F4151Ax3. 2. Collate jam access A7054A 3. Idler shaft collation deskew A2852A 4. Eject shaft C/B assy A7079A 5. Eject drive shaft assy A7080A 6. Roller Fold Rollers C8175Ax3 7. Belt F5123A <u>3million</u> Lenze Clutch 04 181-128	4c-2	
C24	Check all side guides for movement (feed trays and accumulator), stop position and parallelism to chassis.	Level 3	<5	-		
C25	Check all clutch pins G0167P or G0079A are intact.	Level 3	<5	Replace A/R		

Item #	Maintenance item – Head Unit	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
C26	Check all unit screw security (pay particular attention to all handles) – tighten as required.	Level 3	<5	-		
C27	Check sensor cable JST connectors are all properly plugged in. Also check ribbon cables headers (these are more likely to be dislodged).	Level 3	<5	-		
C28	Check all restraint straps are intact - replace if required.	Level 3	<5	Replace A/R		
C29	Go though the Engineer menu to check all Analogue and Digital sensors – calibrate if required.	A/R	<5	Replace A/R		
C30	Go through the Engineer menu to check each clutch, brake and solenoid.	A/R	<10	Replace A/R		
C31	Check and adjust (if required) fold lengths (in 'View Fold Settings' for Maxi or Module Options/ Fold Plate Lengths in Maxi+).	Level 3	<5	-		
C32	Check and adjust (if required) the collation of forms in the engineer window.	Level 3	<5	-		
C33	When all service or repair operations have been carried out, the machine must be left with all parts reassembled, leaving no risk of injury. Complete service log sheet.	Level 2, 3	<5	-		

Times:

Level 1: <20 mins
Level 2: <1.5 hrs
Level 3: <4.5 hrs

Maintenance Schedule - DTI

Level 1 = Operator level (frequency will depend on usage and applications).
Level 2 = Intermediate Service (frequency usually ½ FULL PM).
Level 3 = FULL PM Service

Check software versions and implement mandatory updates within TB's and TT's (available on the PFE website).

Item #	Maintenance item – DTI Units	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
D1	Clean all paper transport rollers using water or recommended cleaning fluid. Check joggler tyres (if fitted) for alignment.	Level 1,2 & 3	<5	-		
D2	Clean all sensors with **approved** air dusters.	Level 1,2 & 3	<5	-		
D3	Clean the belts on the Conveyor lower DTI assy (A7264A) with recommended cleaning fluid. Replace as required.	Level 1, 2 & 3	<5	(2million or 1million if m/c running for >8hrs/day). 1. Belts G5072A (set) 2. 8mm T bearing D1040Ax2	4-6	
D4	Remove DTI covers.	Level 2 & 3	<1	-		
D5	Vacuum clean to remove internal dust. Clean all covers.	Level 3	<5	-		
D6	Remove the Turnover Cassette A7265A. Clean gears and posts. Apply grease (silicon based) if required. Check gear movement - sideways and rocking (replace gears if required). Check for any tight spots in the drive. Check all gear drive pins are in tact and not loose. If so, replace gear and pin. This can cause loss of drive and noise problems.	Level 3	<15	(2million or 1million if m/c running for >8hrs/day). 1. Gears: F4150Ax2 and F4201A 2. 8mm T bearing D1040Ax4 3million 1. Brake Lenze 03 assy A7331A	4-7	
D7	Remove and clean the Cassette Detent Assy A7293A. Apply light oil and clean off any excess.	Level 3	<10	-	4-9	
D8	Inspect Module for damage and safety (covers are all intact, interlocks function, warning labels in place).	Level 2 & 3	<5	-		

Item #	Maintenance item – Head Unit	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
D9	**Drive side gears / clutches (applicable to all):** clean idler gears and posts. Apply grease (silicon based) if required. Check gear movement - sideways and rocking (replace gears if required). Check for any tight spots in the drive. Check all gear drive pins are in tact and not loose. If so, replace gear and pin. This can cause loss of drive and noise problems.	Level 3	<30	(2million or 1million if m/c running for >8hrs/day). 1. Gears: F4151Ax1 and F4182Ax2 2. Cassette Rotate Lenze clutch 181-132 3. Conveyor Clutch EC30 179-110 4. Cassette drive Lenze Brake 181-132 5. Cassette Rotate Lenze Brake 181-133** **Order A7331A for replacement.	4-2	
D10	**Operator side gears / clutches (applicable to all):** clean idler gears and posts. Apply grease (silicon based) if required. Check gear movement - sideways and rocking (replace gears if required). Check for any tight spots in the drive. Check all gear drive pins are in tact and not loose. If so, replace gear and pin. This can cause loss of drive and noise problems.	Level 3	<15	(2million or 1million if m/c running for >8hrs/day). 1. Gears: F4151A A/R 2. Conveyor Brake EC30 179-110x1 3. Cassette reverse clutch 179-110x1 4. Cassette forward clutch 179-109x1	4-2	
D11	Remove and check motor assembly. Clean area and ensure all parts are intact (tight spots, belt noise or signs of wear). Clean clock disk on the motor assembly. Check motor pulley is tight on the motor shaft.	Level 3	<5	2million 1. Motor Pulley F1372A (220v) or F1373A (110v) 2. Belt F5145A	4-9	
D12	Check all unit screw security (pay particular attention to all handles) – tighten as required.	Level 3	<5	-		
D13	Check sensor cable JST connectors are all properly plugged in. Also check ribbon cables headers (these are more likely to be dislodged).	Level 3	<5	-		
D14	Check for squealing noise from clutches. If so, remove and clean and replace if necessary.	Level 3	<5	Replace A/R		
D15	Check all clutch pins G0167P or G0079A are intact.	Level 3	<5	Replace A/R		
D16	Go though the Engineer menu to check all Analogue and Digital sensors – calibrate if required.	A/R	<5	Replace A/R		
D17	Go through the Engineer menu to check each clutch, brake and solenoid.	A/R	<10	Replace A/R		

Item #	Maintenance item – Head Unit	Frequency	Time to complete (mins)	Replacement Part Numbers and Interval Cycle	Ref Manual (Page)	Complete (✓)
D18	When all service or repair operations have been carried out, the machine must be left with all parts reassembled, leaving no risk of injury. Complete service log sheet.	Level 2, 3	<5	-		

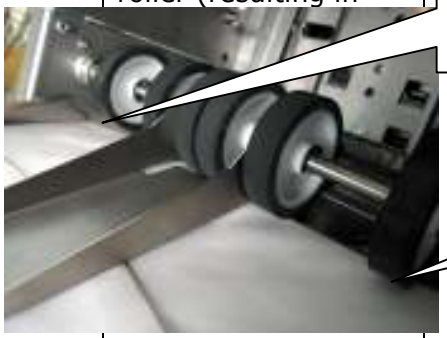
Times:
Level 1: <15 mins
Level 2: <25 mins
Level 3: <2.5 hrs

Appendix to PM Schedule

Envelope Feeding Set-up Options

Please note that any combination of these tips could help with particular envelope types.

Setup Option	Envelope type	Side guides settings	Pick-up feed system required	Separator gap setting	Separator Spring Action	Notes
1	Envelope lead edge curled/twisted and does not sit parallel to the separator/pickup roller (resulting in	Clearance up to 2mm Max	Pre-feed (tractor) part no. A7217A	Separator pad overlap >0.5mm.	-	If the envelope is skewing into the sideguide(s) then initially remove and reload entire hopper. If problem persists then re-adjust the side guides to give slightly greater clearance. The use of the tractor should help to flatten the curled envelopes at the point of separation to prevent this. Note, the twist on the envelope should not be more than 1/4" (6.5mm) when placed flat on a table.



Setup Option	Envelope type	Side guides settings	Pick-up feed system required	Separator gap setting	Separator Spring Action	Notes
2	Tractor fitted but experiencing streaming and doubles issue.	as above	Remove the outer upper tyres from the pre-feed assembly as shown.	Separator pad overlap >0.5mm	-	
3	Set-up as point 2 but still experiencing streaming and doubles issue. Operator separator adjuster (both sides). + (turn ACW) = tighter setting - (turn CW) = loose setting	as above	-	Separator pad overlap >0.5mm	Separator spring action locked to prevent any separator movement downwards. This is carried out by adjusting the 2 locknuts to the underside of the sep. bracket.	Separator adjustment is now limited - need to back off the separator lock nuts before any adjustments can be made. No operator intervention allowed. Lock Separator using the lock nuts (both sides)

Setup Option	Envelope type	Side guides settings	Pick-up feed system required	Separator gap setting	Separator Spring Action	Notes
4	Running curled/twisted envelopes - no longer having stream or double issues but only experiencing skew.	as above	Remove the outer lower tyres from the pre-feed assembly as shown.	Separator pad overlap >0.5mm	-	
5	Envelope is sitting flat in the hopper and does not have any curl across the lead edge.	Clearance up to 2mm Max total. See note 1.	Standard Feed shaft (part no. A7073A).	Separator pad overlap 0.5mm or less	-	
6	As above but experiencing pick-up issue.	as above	If poor pick up is experienced it is always	Separator pad overlap 0.5mm	-	-

Setup Option	Envelope type	Side guides settings	Pick-up feed system required	Separator gap setting	Separator Spring Action	Notes
			best to ensure that side guides are not set too tight and restrictive on the envelope pack.			
7	As above and pick-up issues persist.	as above	Loosen the separator, if this doesn't help or leads to doubles then try alternative rollers and then the tractor.	Separator pad overlap <0.5mm	-	Current options include slotted or silicon types. Note, the joggler is fitted standard to the outside only. It is essential that bumps in-line across the shaft otherwise this will encourage envelope skew.

Additional Notes for good envelope feeding:

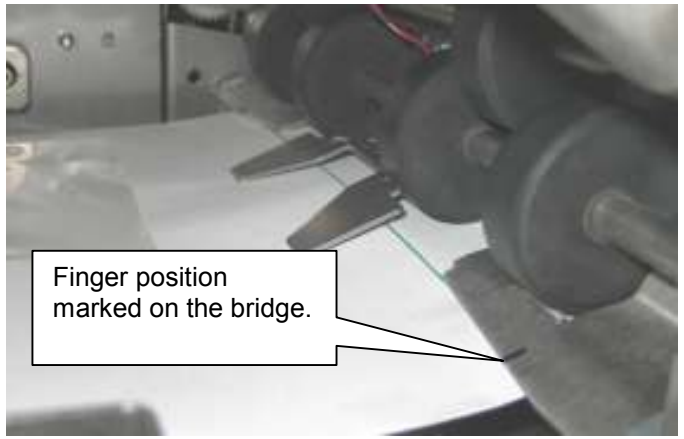
1. Hopper capacity is very dependent upon envelope types. If feeding problems are encountered it is best to try reducing the amount of envelopes loaded (note this is particularly applicable on twisted envelopes). For optimum performance load 300 envelopes max.

2. It is very important that both separator pads are set at the same position (it shouldn't be used to try and overcome skewing). Note, an uneven separator and sometimes a separator that is set too tight will deform the envelope resulting in crashes further downstream.

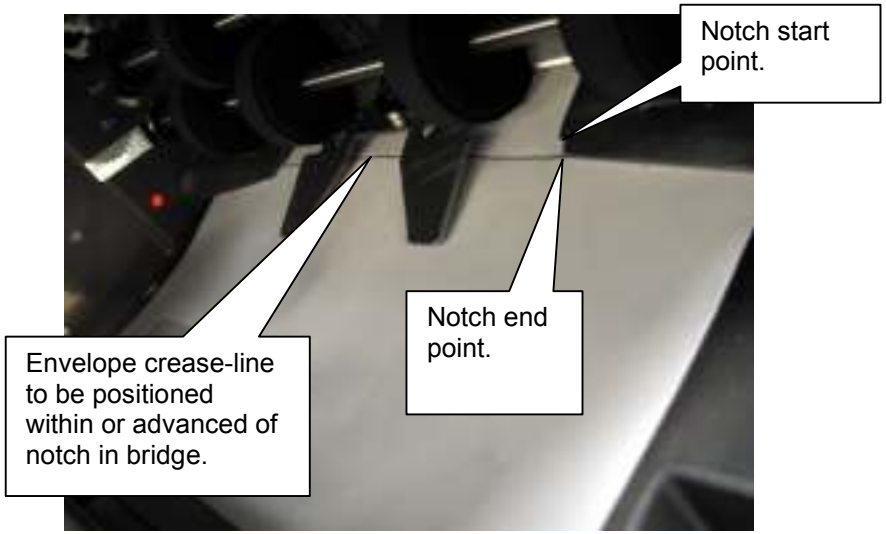
3. If the separator is set very tight (maybe necessary to overcome doubles etc) and the deskew value is set to high this can result in too much drive on the envelope and it will deform badly as it enters the deskew rollers. It is best to start with deskew values set to no/low.

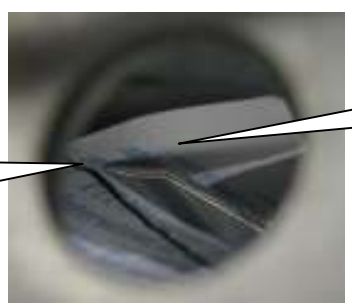
4. Deskew tapes can be fitted onto the deskew and envelope feed bridge to provide assistance into the deskew rollers which reduce envelope skew. Retrofit part numbers TBA.

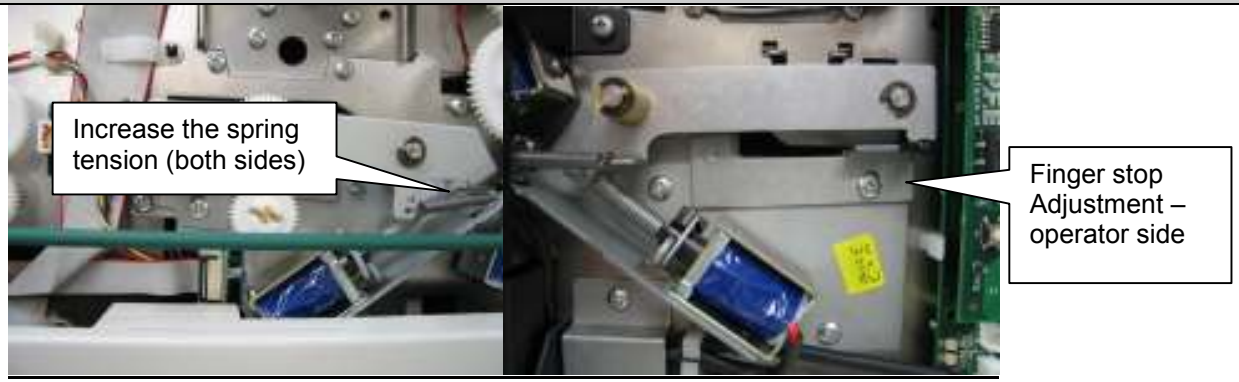
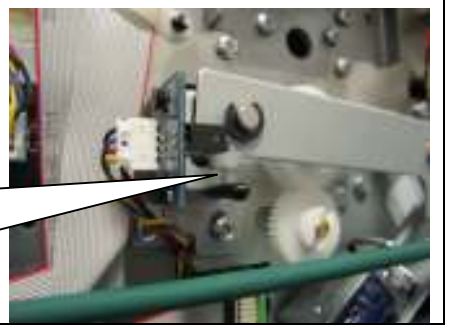
Guidelines for good Envelope Insertion.

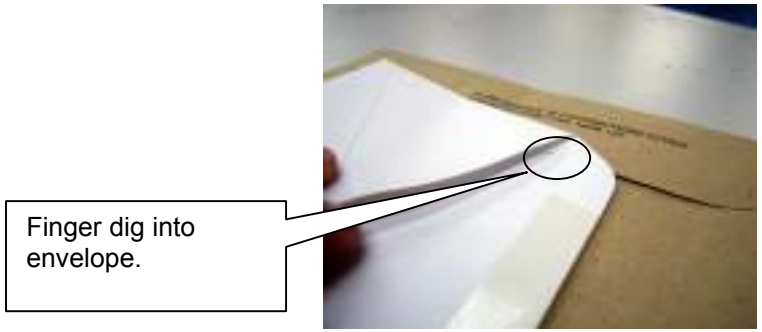
Setup Option	Action Required	Description
1	Set and lock side guides.	Set to 2mm Max (1mm either side). Only open up clearances if experiencing envelope skew into the side guide. Once set - lock both sides into position and check by placing a handful of envelopes in the hopper for clearance and pickup.
2	Separator setting and adjustments.	To be set even and equal to approx 0.5mm overlap (default). Generally, this setting is light with a standard pick-up roller types and slightly heavier with the Tractor (pre-feed) assembly. In addition, the separator can be locked in position - see point 3 'Envelope feeding setup'.
3	Outer finger setting set correctly to the envelope width.	To test for this, mark the extreme edges of the external fingers on the chassis bridge that they sit against - see below. Run an envelope though the system by hand and stop it at the insertion area. The finger position marks on the chassis can then be used to check their position relative to the envelope. These marks should be equally spaced (either side) from the edge of the envelope. The default finger setting is approx 5/7mm from the edge of the envelope and can be adjusted inboard if required. In addition, check if the insert is fully coved by extremes of the outer fingers. 

Setup Option	Action Required	Description
4	Middle fingers opening the throat of the envelope.	Again feed an envelope by hand and stop it slightly forward from the start of the notch position. Engage the fingers manually or within engineer and then check for middle finger entry using the viewing hole on either side of the envelope feed side plates - see below. Note, if the fingers are not supporting/opening the middle of the throat (envelope throat dimensions >22mm) then the middle fingers will require extending.
5	Collate pocket width is correct for envelope.	Ensure the widest document (insert) once placed the collate pocket gives 2mm clearance to narrowest point. Also, note any Fine Tuning or Engineer adjustments will adjust the outer finger position. If these adjustments are carried out then re-check point 3 and adjust (if required).

Setup Option	Action Required	Description
6	Envelope Stop Position.	Adjust such that it falls within the Notch position (+ve value moves the envelope towards the wetter/sealer and -ve back) see below. 
7	Envelope pickup issues.	see 'Envelope feeding Setup' points 2, 3, 6 and 7.
8	Envelope skew issues.	see 'Envelope feeding Setup' points 1 and 4.

Setup Option	Action Required	Description
9	Envelope skew at insertion area.	The check for this is to see whether the envelope crease line is parallel to the notch on either side. The skew limits are within the start/end points of the notch - see photo in setup option 6 above. If experiencing skew beyond this - then check points 1, 2, 7, 8 and for any catch points through the envelope path. In addition, Improved guidance into the envelope deskew rollers can be provided by fitting tapes onto the sensor support assembly (B4427A) and envelope feed bridge, part numbers TBA.
10	Finger actuation start position.	Mark the inside of the crease line and then feed an envelope by hand to the start of the notch position. Then using the viewing hole on the envelope feeder side plates - check the finger start position on either side is sitting on or slightly behind the marked creaseline - see figure below. If this is not set - then the stops need to be adjusted to position. Once this is OK ensure 4mm stroke is set on the finger solenoids (either side).  Looking through the viewing hole – the finger sits on or slightly behind the envelope creaseline. Finger stop Adjustment – drive side

Setup Option	Action Required	Description
		
11	Envelope Streaming.	If the envelope has stream fed then there is a tendency for the envelope to dive between the fingers and brass overguides. If this has occurred, carefully remove the filled envelope and check point 2 and 7. Note, brass overguides should only be fitted for problem jobs.
12	Fingers not returning into home position.	This is a visual check during machine running for fingers returning to home (either side) - see below. Corrective actions if they fail to return fully home are 1) increase the return spring tension (either side) – as shown 2) look for sticking finger assembles. 

Setup Option	Action Required	Description
13	Fingers digging into envelope - not pulling In cleanly.	This is a visual check during machine running for fingers not pulling in fully (either side of envelope) - this can also leave finger pierce marks on the envelope - see below. The corrective action is dress the fingertip to remove any sharp edge until a replacement is fitted. 

MAINTENANCE & ADJUSTMENTS

3.2 FEEDER SEPARATOR

3.2.1 Separator adjustment

The feeder separator has 4 user-adjustable settings:

Position A:	0 to 0.75mm
Position B:	0.75 to 1.5mm
Position C:	1.5 to 2.5mm
Position D:	2.5 to 4mm

The separator is largely automatic in operation, with a negative gap on the smallest settings. The separator pads are spring mounted, hence a range of thicknesses can be accepted for each setting - for thicker inserts, the separator can open up to accommodate the material.

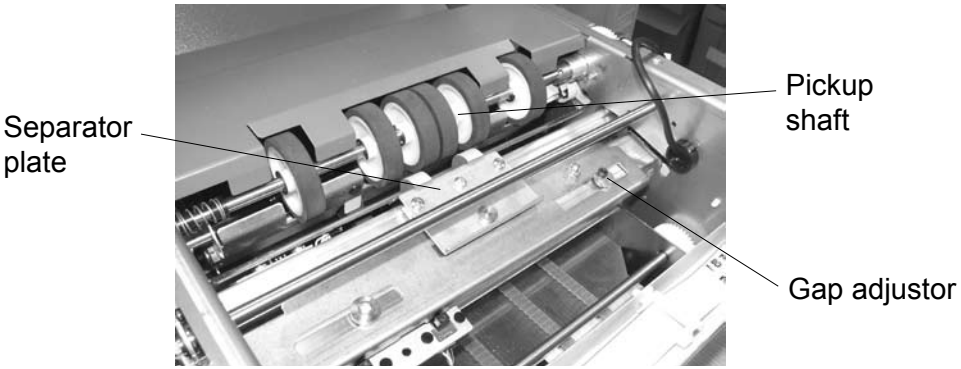


Fig. 1

3.2.2 Separator replacement

If doubles are continually being fed, or damage occurs, the separator may need replacement. This is effected by replacement of the plate assembly that the separator pads are permanently bonded to. To gain access, remove the RH side cover (see section 3.1.2) and lower the LH side cover. Remove the 2 screws either side of the hopper, located near the top of the chassis sides. Lift out the hopper, unclipping the sensor block as it is withdrawn. The separator is now visible, as shown in Fig. 1 above. Remove the central screw and lift out the separator plate. When replacing, no further adjustment is necessary.

3.2.3 Separator gap

The separator gap is factory set using a jig and should not normally require adjustment, but if for any reason it does so, proceed as follows:

1. Slacken the central screw on the alignment adjustor shown in Fig. 1.

2. With the smallest setting 'A' selected, turn the brass adjustor so that there is approx. 0.5mm negative gap, as shown in Fig. 2 below. This can be gauged by winding in a piece of 80gsm paper and observing that it corrugates slightly. Tighten the central screw when the setting is correct and test run the machine. Adjust further if required.

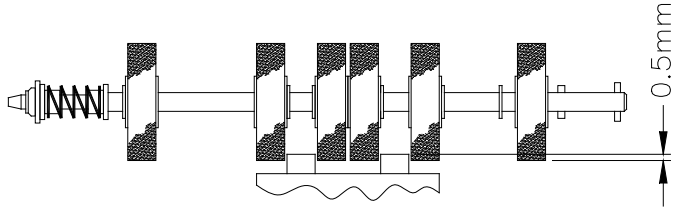


Fig. 2

3.2.4 Lateral adjustment

The separator plate must be laterally located so that the separator pads are exactly central between the tyres. If adjustment is required, turn the nut shown in Fig. 3 below, located on the LH side of the unit.

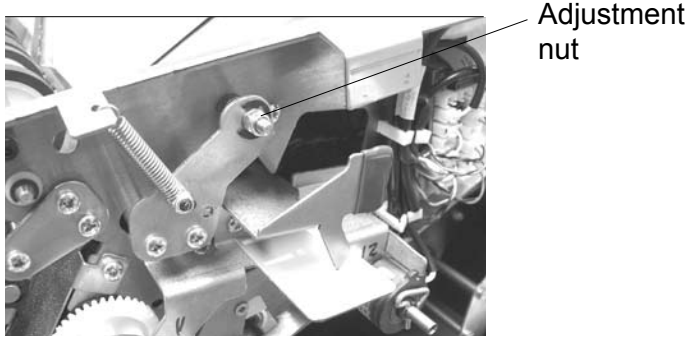


Fig. 3

3.2.5 Pickup roller tyres

If the tyres on the pickup rollers become ragged or worn, they must be replaced. Note that tyres cannot be replaced separately as they are ground concentric on the cores - see section 4b.5 for part numbers. The shaft is held in place under spring pressure, as shown in Fig. 2 above. Ensure the drive peg is fully engaged when replacing.

3.2.6 Alternative tyres/rollers

Various alternative tyres or rollers are available to provide better pickup for problem paper types, as listed below. These are supplied either as a tyre only, or as a tyre and core assembly, where the tyre must concentrically ground in place on the core. Note that for the lobed tyres D0052A, only the outer 2 tyres on the shaft are replaced.

For assistance in specifying the correct tyre/roller for a particular application, contact the Technical Support department.

Hi-Grip Roller	C8193A
Slotted Roller	C8194A
Roller 30-35 Hardness	C8203A
Lobed Tyre	D0052A
Silicon Feed Tyre	D0037A*
Coated Silicone Tyre	D0059A**

* Also available on complete shaft assy. A7268A

** Also available on complete shaft assy. A7271A

3.3 3 PLATE FOLDER SEPARATOR

3.3.1 Separator adjustment

Each tray of the 3 plate folder is fitted with a separator. This is of the spring loaded type with zero gap and normally requires no adjustment. However, circumstances may arise which necessitate abnormal adjustment, eg. double-folded A3 paper (which may require a gap to be set) or setting a stop to ensure the gap cannot open.

The adjustor is located on the LH side of the folder, accessed by removing the internal cover:

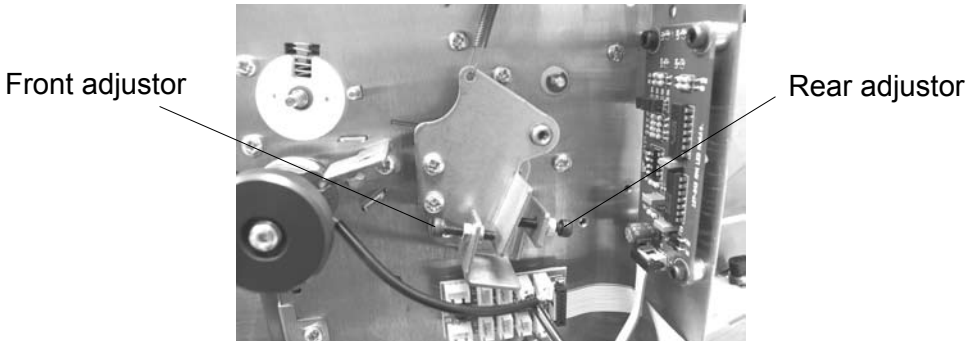


Fig. 4

Referring to Fig. 4 above, to open the gap, slacken the lockscrew on the front adjustor and turn the screw to open the gap, then tighten the locknut. To prevent the gap opening, turn the rear adjustor so that it just contacts the plate.

For normal running, each screw is set to approx. 1mm clearance from the plate.

3.3.2 Separator roller replacement

If doubles are continually being fed, or damage occurs, the separator pad or pick-up roller may need replacement. The pickup roller is mounted on a spring-loaded shaft and removal is a matter of springing it out after gaining access. For the top tray, remove the top horizontal cover (see section 3.1.2) - the pickup roller shaft is visible below. For the lower trays (where fitted), pull out the hopper trays and the pickup roller shaft will be visible inside the unit. When fitting a replacement roller, note that it is fitted with one-way clutches - reassemble so that when viewing the end of the shaft from the spring side, the roller rotates freely in a clockwise direction.

contd.

3.3.3 Separator pad replacement

The separator pad is permanently bonded to an extrusion, and both items are replaced as an assembly. Access to all three is gained by pulling out the hopper tray, then withdrawing the infeed plate, as shown in Fig. 5 below.

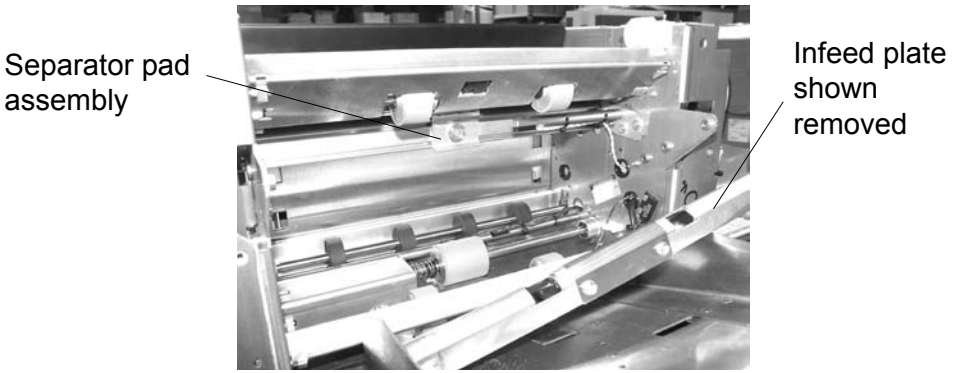


Fig. 5

Remove the screw retaining the pad assembly and fit the new item, noting that it is free to rock slightly when the screw securing the brass spigot is tightened.

Important: when replacing the infeed plate ensure it is properly located - it can sometimes appear to be while still being slightly misplaced.

3.3.4 Curled paper Guides

To assist the feeding of curled paper, two optional guides are available:

A3310A	Curled Paper Guide (Light)
A3311A	Curled Paper Guide (Heavy)

These mount on the bridge of the feed trays on either 3-Plate or 2-Plate folders. Fixings are supplied to utilise the two esisting holes on the bridge. They present a wire frame (light) or rollers (heavy) to the paper as it feeds, helping to remove the curl.

3.4 3 PLATE FOLDER ROLLERS

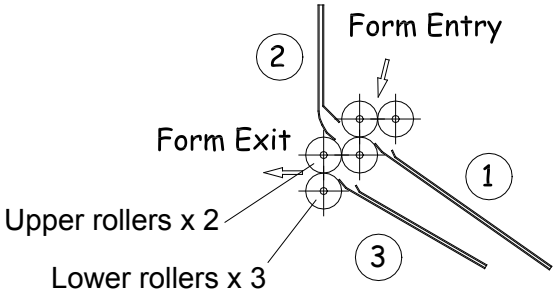


Fig. 6
Showing schematic view of 3 Plate Folder

3.4.1 Lower roller removal

There are 5 fold rollers in the 3 plate folder, 3 lower rollers and 2 upper. All can be removed in-situ relatively easily, as described in the procedure below:

1. Open the LH side cover, remove the RH side cover and also the LH & RH lower side covers (see section 3.1.2).
2. Remove the 2 screws either side securing the fold-plate box and lift out the box from the rear. This provides access to all 3 lower fold rollers.

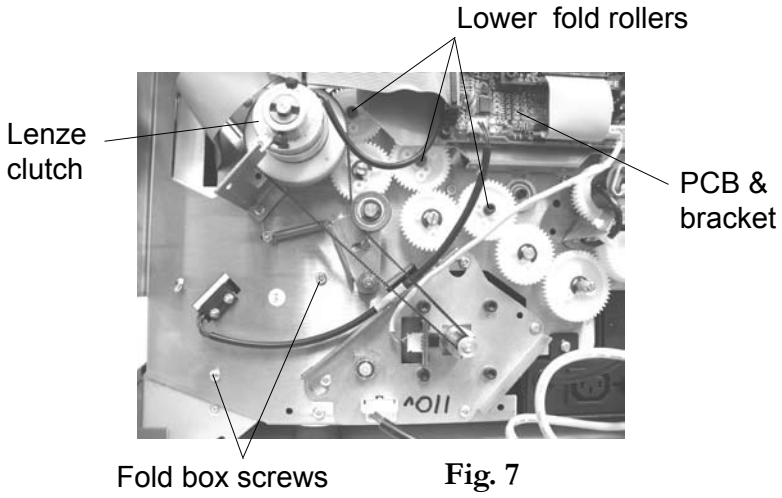


Fig. 7

3. On the RH side, remove the 3 nuts retaining the PCB bracket and withdraw it as far as the cables allow (do not disconnect any cables).
4. Slacken the 2 screws retaining the Lenze clutch (see Fig. 7 on the previous page) and slide it off the shaft. Support it suitably to avoid

straining the cable. Remove the 'E' clip next to the gear and slide this back as far as the clutch locator allows.

5. Remove the 3 screws and gears on the lower fold rollers and witdraw them, then remove the dowel pins and spigots.
6. On the LH side, remove the 3 screws on the ends of the roller shafts, then remove the flanged bearings on both sides, with the waved washers on the LH side.
7. Reaching in from behind, lift the fold rollers out of the chassis.
8. Fit new rollers in reverse order to removal. Ensure that the 'E' clip is in place before refitting the Lenze clutch - this acts an air-gap spacer.

3.4.2 Upper roller removal

The easiest way to access the 2 upper rollers is to remove the pivoting fold box complete.

1. Disconnect the sensor cables from the main PCB at J17 & J18, and cut cable ties as required.
2. On the LH side, remove the 2 screws securing the fold plate motor housing. Remove the screw and flanged bearing at the RH end of the pivot bar, and the screw, flanged bearing and waved washer at the LH end. Lift the fold box out of the chassis (shown in Fig. 8 below).

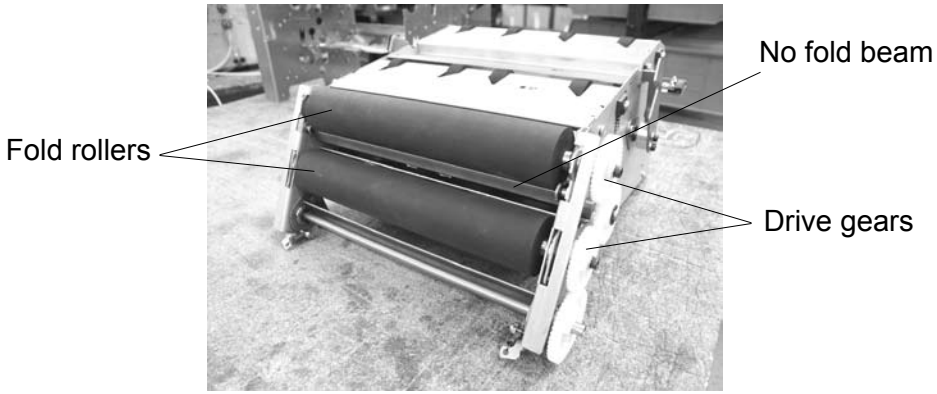


Fig. 8

3. Remove 2 fold roller springs on each side, and the screw at each end of the fold rollers.
4. On the RH side, remove gears, dowel pins and spigots. Lift off the bearings plates on each side to free the roller. Note that the no-fold beam pivots on a plastic spigot bush at each end - these will now be loose.
5. Fit the new fold rollers and reassemble in reverse order to removal, ensuring that the no-fold beam is properly located on the spigot bushes as the plates are replaced. Note also that the gear spigots on the rollers are different sizes to account for the plate thickness.
6. Replace the fold box in the chassis, ensuring that the waved washer at the LH end is properly located. Refit the fold plate motor housing and reconnect the sensor cables, securing with cable ties as required.

3.5 3 PLATE FOLDER ACCUMULATOR

3 plate folders may include an optional accumulator unit for collating or di-vering forms. The accumulator may also include a diverter tray for receiving diverted forms, otherwise these will remain in the accumulator for manual removal.

3.5.1 Accumulator conveyor access

Should problems occur in the accumulator conveyor, it can be pivoted down in the chassis for access to the belts, stepper motor or sensors. Proceed as follows:

1. Remove the 6 screws securing the underpanel below the accumulator.
2. Remove the 2 screws securing each sideguide, as shown in Fig. 9 below. Support the conveyor from below as the screws are removed.

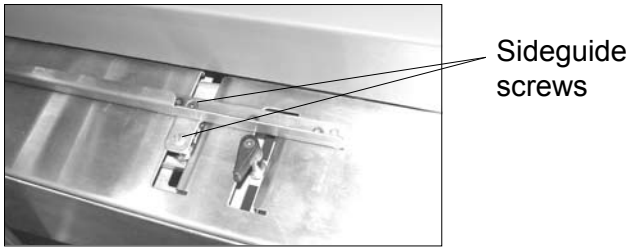


Fig. 9

3. Lower the conveyor downwards to gain access to the belts, stepper motor, pawl sensor and vane sensor, as shown in Fig. 10 below.

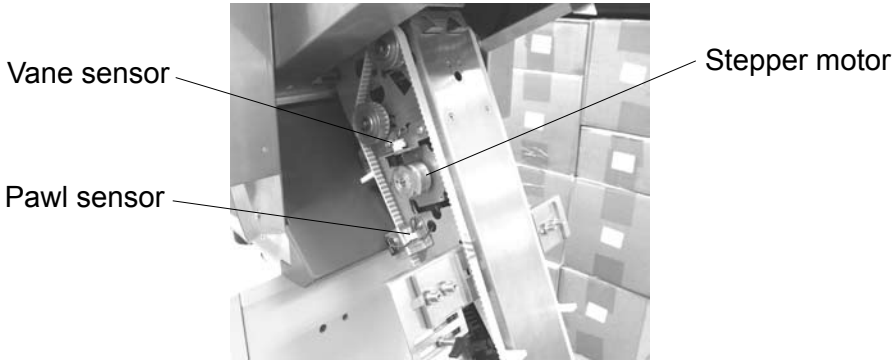


Fig. 10

3.5.2 Accumulator sideguides

The sideguides are adjustable for parallelism, should they be found to running out of true. Slightly slacken both of the screws shown inFig. 9 and twist the sideguide to suit - note it will pivot slightly about the countersunk screw.

3.5.3 Accumulator/overguide removal

To remove the accumulator or overguide, proceed as follows:

1. Remove the RH side cover and open the LH side cover. Also remove the black safety cover on the LH side (section 3.1.2).

Overguide Removal

2. Lift out hopper 3 (if fitted) and remove the two collate covers shown in Fig. 11 below.

Fig. 11

cont.

3. On the RH side, remove the clutch, 'E' clips, gear with 3 dowels and flanged bearing from the end of the overguide shaft (see Fig. 12 below). On the LH side, at the end of the same shaft, remove the flanged bearing, noting the waved washer underneath.

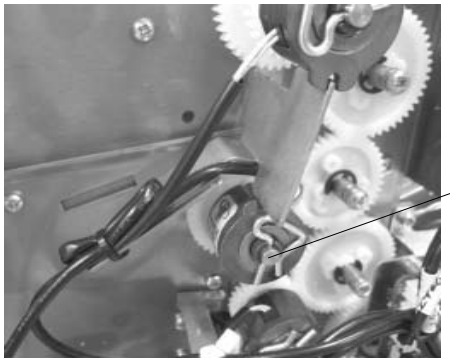


Fig. 12

4. Lift the overguide assembly out of the chassis

Accumulator Removal

5. On the RH side, unplug the ribbon cable from the connector and remove the accumulator screw shown in Fig. 13 below. Also remove the screw on the LH side. Lift the acumulator out of the chassis.

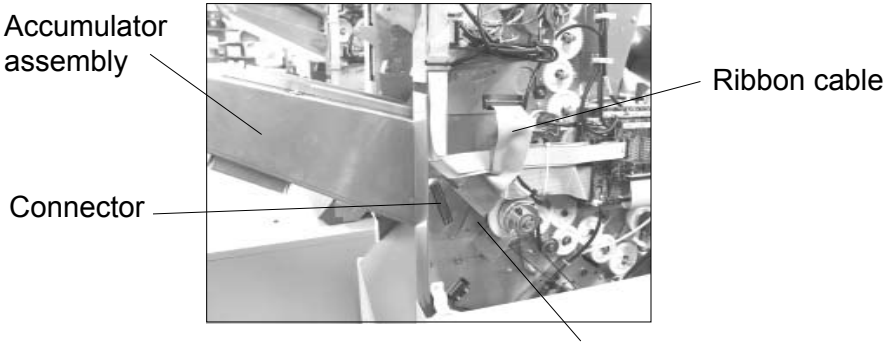


Fig. 13

6. Reassembly is a reversal of removal. When refitting the clutch on the overguide shaft, ensure the lug is engaged with the clutch locator.

3.5.4 Alternative DD sensor position

On later machines (from mid 2006), the double document sensor (located just after the separator on all feed trays) can be clipped into an alternative mount on the other side of the deskew sensor. This may be used if, for example, an area of heavy black printing is in line with the default sensor, causing a false read. For locations, see sections 4c-23 (3-station, top tray), 4c-24 (3-station, middle tray), 4c-25 (3-station, bottom tray) & 4c-26 (1-station).

3.6 ENVELOPE FEEDER REMOVAL

Access to any operations in the collate area will be greatly eased by the removal of the envelope feeder. This is a straightforward matter as described below.

1. Remove LH & RH Insert Head side covers (section 3.1.2).
2. On the LH side, remove the control panel assembly. When facing the assembly, remove 2 x screws and loosen 1 x screw inside the chassis at the LH end (the loosened screw is in the keyhole slot). At the RH end, remove 1 x screw outside the chassis and loosen 1 x screw inside. Unplug the ribbon cables and lift the assembly clear of the machine.
3. On the LH side of the chassis, remove the 2 x screws shown in Fig. 11 below. Unplug the ribbon cable and the JST connector.

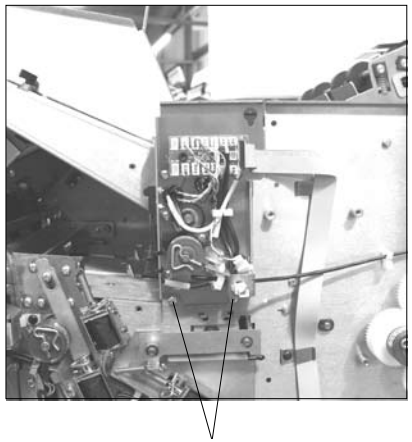


Fig. 11

3. On the RH side of the chassis, remove the 3 x envelope feeder screws, as shown in Fig. 12 below. Also remove the screw for the chain tension shaft if the collate chains are to be removed (see following section 3.7). Note that the top envelope feeder screw is inside the chassis.

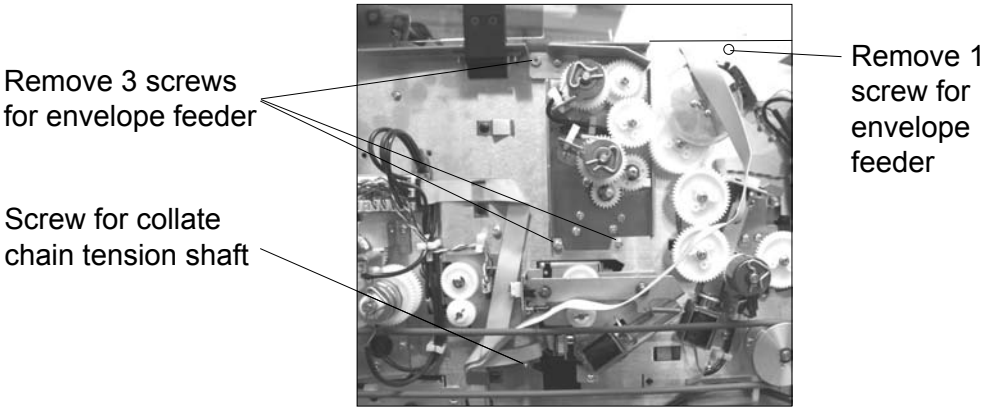


Fig. 12

4. Lift the envelope assembly clear of the chassis.
5. Reassembly is a reversal of removal.

Note: When replacing the feeder assembly, ensure the gear train is not tight - there must be a small amount of backlash. If gears are too tight, slacken off the screws and move the feeder assembly slightly until some backlash is evident. Retighten the screws.

3.7 COLLATE CHAIN REPLACEMENT

The collate chains or pawls must be replaced if they are excessively worn or damaged. To gain access, remove the envelope feeder assembly as described in the previous section 3.5. Also slacken, but do not remove the screw for the chain tension shaft shown in Fig. 12.

The collate area is shown in Fig. 13 on the following page.

Collate chain replacement continued.

1. Remove the collate backstop assembly by taking out the 3 x screws shown in Fig. 13 below. As the assembly is lifted out, disconnect the ribbon cable from the PCB and free the cable from the slots in the bracket. The assembly with solenoids is now free.

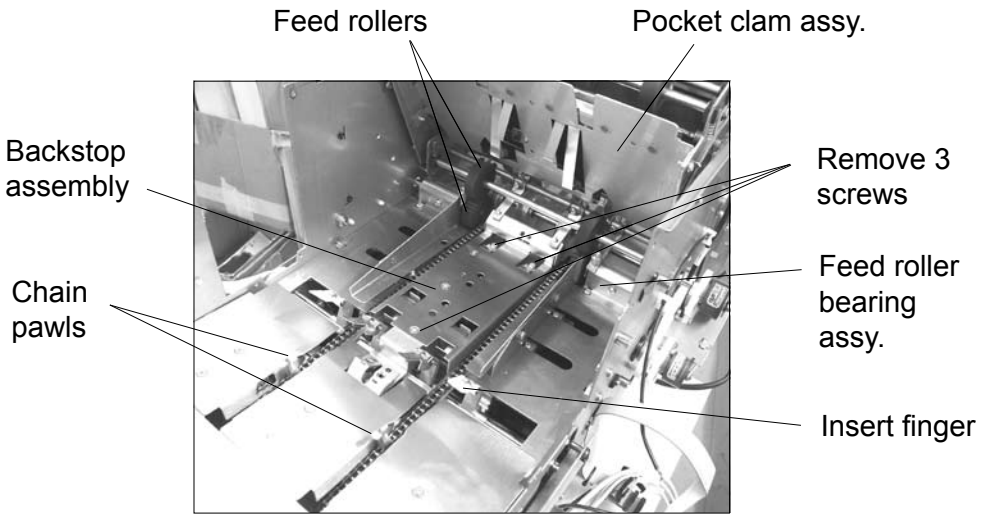


Fig. 13

2. Reach inside the chassis and free the end of the chain tension shaft from the slot in the chassis, then withdraw the spigot at the other end. This will relieve chain tension.
3. Each pawl is fitted with a split-link. To separate the chain, remove the clip. The chain can now be pulled out of the chassis.
4. The new chain can now be threaded into place, or a the new pawl fitted as required. **Important:** ensure that the pawls of each chain are aligned. Note that one complete chain comprises 2 x 61-link chain sections, 2 x pawls and 2 x split-links. The side plate supplied with the split-link is discarded - the side of the chain pawl is used instead.
5. Refit the tension shaft to tension the chain. Refit all other parts in reverse order to their removal.

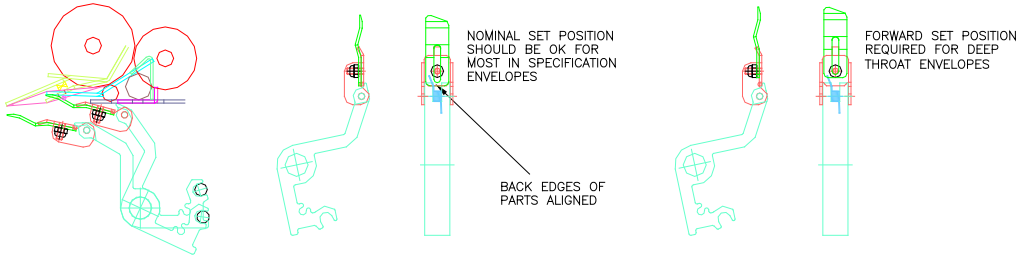
3.8 INSERT FINGER REPLACEMENT

If paper crashes when inserting are being encountered, this may be caused by worn or broken insrt fingers, or more likely, a broken finger spring. The fingers are fully exposed (as shown in Fig. 13) when the envelope feeder is removed, described in section 3.6. Later Machines (from mid 2006) are equipped with an inspection hole in the envelope feeder side plates to assist with fault finding of finger entry problems. The holes can be seen after removal of the head side covers. Also from the same date, the middle insert fingers consist of a 2-part design for greater adjustment flexibility - see section 4a-20.

To replace the fingers, remove the retaining clip and push out the pin with a Ø3 x 8mm dowel pin E5074A - this will secure the spring in position. After fitting the new finger and original pin (replacing the Ø3 x 8mm pin), ensure that the spring tang is located in the small slot (outer fingers) or lips over the finger body (inner fingers). Check the condition of the spring also, and replace if broken. Note that the fingers are handed left and right, with the outer pair nylon and the inner pair steel.

Later 2-part inner fingers

From Sept 2006 a revised 2-part design was introduced for the two inner fingers. These provide improved opening of the envelope throat, particularly on envelopes with long, flat, central throat sections. They can also accommodate very deep (and often out of specification) envelopes. Adjust by removing the finger and slackening the M3 nut and using the setting criteria shown below.


NOMINAL SET POSITION SHOULD BE OK FOR MOST IN SPECIFICATION ENVELOPES
BACK EDGES OF PARTS ALIGNED
FORWARD SET POSITION REQUIRED FOR DEEP THROAT ENVELOPES

NOTE THAT ALTHOUGH THE FINGERS CAN BE SET BETWEEN THESE TWO POSITIONS, IT IS EXPECTED THAT THEY WILL SUIT MOST APPLICATIONS.

NOTE THAT ALTHOUGH THE FINGERS CAN BE SET BETWEEN THESE TWO POSITIONS, IT IS EXPECTED THAT THEY WILL SUIT MOST APPLICATIONS.

3.9 COLLATE FEED ROLLER REPLACEMENT

Forms are driven into the collate area by an upper and lower pair of feed rollers either side, as shown in Fig. 13. The lower rollers are gear driven and supported in bearing assemblies. The upper rollers are supported on a shaft in 'T' bearings. If the rollers become worn, ragged or otherwise damaged they must be replaced, as described below:

1. Remove the pocket clam assembly (see Fig. 13). To do this, locate the 2 clutches near the end of the feed rollers on the LH side. Remove the clip of the upper clutch and withdraw it, and also remove the clutch locator. This will allow removal of the 'E' clip, gear and dowel pin of the gear on the end of the feed roller shaft. Remove the screw on the spigot plate that acts as a pivot for the pocket clam assembly, but do not remove the plate at this stage. On the RH side, disconnect from the ribbon splitter PCB the 2 sensors for the pocket clam assembly. Now pull out the spigot plate on the LH side and lift out the clam assembly, leading the sensor wires through the chassis cutout.
2. Remove the LH feed roller bearing assembly (see Fig. 13) by taking out the 2 vertical screws on the bracket and sliding the assembly towards the chassis to free the latch spigots underneath. The assembly can now be angled out of the chassis. The feed roller is tightly pressed on the shaft and replacement is a matter of pulling off the old one. Do not use adhesive on the new item. Also check the condition of the bearings and replace if necessary.
3. Remove the RH feed roller bearing assembly (see Fig. 13) as follows: remove the clutch, pin and gear from the end of the shaft by removing or withdrawing the surrounding gears, clutch and clutch locator. Remove the roller bearing assembly by taking out the 2 vertical screws on the bracket and sliding the assembly towards the chassis to free the latch spigots. The assembly can now be angled out of the chassis. Replace roller/bearings as required in the same way as for the LH assembly.

Upper roller replacement

Removal of the upper feed roller shaft is simply a matter of taking out the springs and 'T'bearings. Note that the rollers are not removable from the shaft - fit a new shaft assembly instead.

When roller replacement is complete, refit the pocket clam assembly in reverse order to removal. Note that the sensor wire connections are: green/white to J9, red/black to J10.

3.10 CLOSER ROLLER REPLACEMENT

There are 4 closer roller shafts on the machine; 2 shafts in the body of the insert head, 2 shafts in the opening cover located below the envelope hopper. the shafts all rotate together and are fitted with a clutch and brake at alternating ends, allowing bi-directional movement. This movement closes and seals the flap in one direction, then reverses to eject the sealed envelope. If the rollers become excessively worn or gummed and cause slipping, they must be replaced. **Note:** cleaning should be carried out using a cloth dampened with water rather that Roller Cleaning Fluid. The rollers cannot be removed, only shaft assemblies are available.

Shafts in insert head body

To remove the the shafts in the body of the head, removed clutches, 'E' clips, gears and drive pins as required to lift the shafts out of the chassis.

Points to note:

1. To remove the upper shaft, the bridging plate above it will also require removal.
2. Removal of the clutch at the LH end may require removal of the wetter fluid spout, though this should flex sufficiently.
3. When refitting the upper shaft, fit the 25T gear to the RH end before assembling the flanged bearing into the chassis - the locator bracket will block the gear otherwise.

Shafts in opening cover

Replacement of the shafts in the cover is a straightforward matter of removal of 'E' clips, springs and 'T' bearings to free the shafts.

3.11 WETTER BEAM SETTING

The wetter beam descends on the passing filled envelope, pressing the open flap against the damp spong on the wetter tank. There is an adjustable stop each side to control the settings, and a solenoid each side to pull the beam down. A single solenoid on the LH side lifts it back up. Correct adjustment of all these elements is critical to ensure effective wetting.

To set the adjustment of the wetter beam, setting gauge C7403A must be obtained. This is a shaped aluminium bar that sets the adjustable stops correctly.

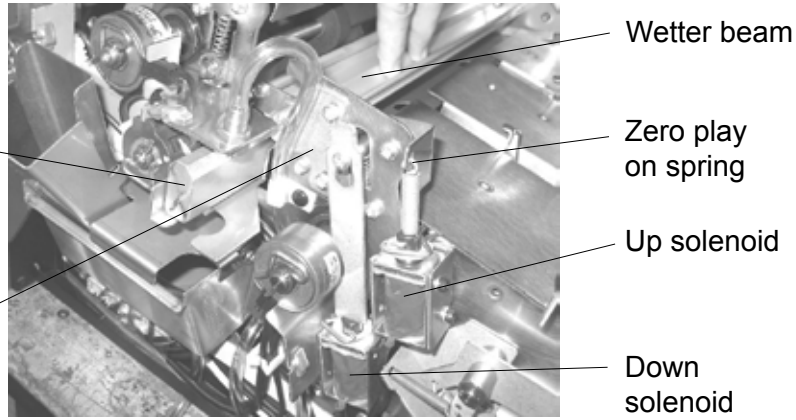


Fig. 13a

Setting procedure (refer to Fig. 13a above)

1. Remove/lower both side covers (section 3.1.2)
2. Slacken the screws on the adjustable stop each side. Remove the wetter tank and replace it with the setting gauge C7403A.
3. Hold down the wetter beam to that it contacts the guage, then slide the adjustable stops so that they contact the spigots on the beam. Tighten the screws on the stops.
4. Slacken the adjustment screws on the down solenoid each side. Hold down the wetter beam and slide the solenoids so that the plunger is bottomed when the arm is pulling downwards to take out any play in the pivots. Tighten the screws.
5. With the wetter beam in its raised position, slacken the screws on the up solenoid and slide it so that with the plunger bottomed, any free play is taken out of the spring, without the spring being tensioned. Tighten the screws.
6. Replace the side covers. The wetter beam is now correctly set.

Wetter adjustments in Engineer mode

It is important to note that the wetter beam must be correctly set as described prior to making wetter adjustments in Engineer mode (see 'Settings' on page 3-19 for 100 series, or 'Units Setup' on page 3-24 for 140 series). If the beam is not correctly set, engineer adjustments will not be able to eradicate wetting problems.

3.12 POWER SUPPLIES & PCBs

There is a power supply fitted to the insert head of the machine, and also to each separate unit. Units for standard feeder, 3-tray feeder and 2-plate folder are the same. Unit for insert head is different, as is the 3-plate folder. If failure occurs, the power supplies can be removed without major dismantling.

To remove, proceed as follows:

1. On the RH side, remove the appropriate side cover and lower edge cover. On the LH side, open the side cover and remove the lower edge cover. (see section 3.1.2).
2. On the LH side, remove the single screw retaining the unit to the chassis side plate - this is located close to the fuse on each unit.
3. On the RH side, unplug the cables and remove the 2 screws securing the PSU. Withdraw it from the chassis

The PSUs are shown below and on the following page:

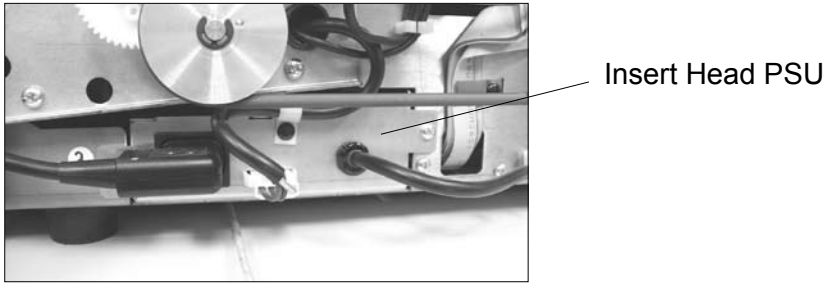


Fig. 14

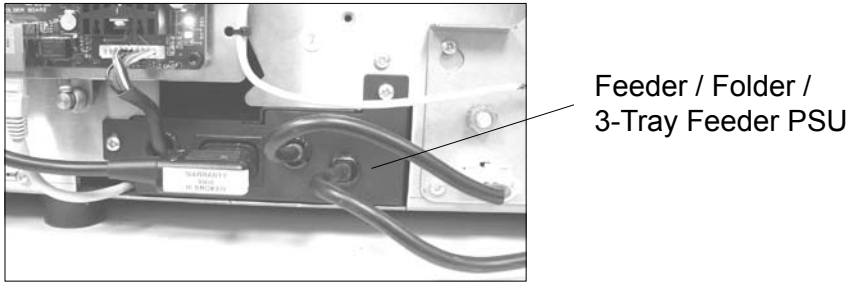


Fig. 15

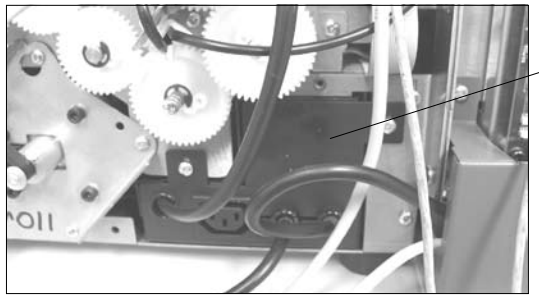


Fig. 16

PSU Part Numbers

The three power supplies fitted to the machine are as follows:

Insert Head PSU	184-167
Feeder/Folder PSU	184-168
3-Plate Folder PSU	184-169

See following page for part number of PCBs

PCB Part Numbers

The PCBs fitted to the machine are as follows:

Insert Head LH

AM4 Control PCB	180-721
Processor	180-720 (mounted on Control PCB)
Control Panel PCB	180-723
Display Inverter	180-765
Ribbon Splitter	180-759

Insert Head RH

Ribbon Splitter x 2	180-759
Ribbon Splitter	180-760 (inside)
Motor Disc	180-746
Fingers (flag)	180-689
Collate Sideguide (flag)	180-689

Feeder RH

AM4 Feeder Folder PCB	180-722
Motor Disc	180-689

Feeder LH

Ribbon Splitter	180-759
Ribbon Splitter	180-761 (centrally located)
Ribbon Splitter	180-762 (centrally located)

3 Plate Folder RH

3 Plate Folder Main PCB	180-724
Expansion PCB	180-768 (Mounted onto Main PCB)
Ribbon Splitter x 3	180-758
Motor Disc	180-746

3 Plate Folder LH

Ribbon Splitter	180-759
Ribbon Splitter x 2	180-760
LED Indicator PCB	180-764
Stepper PCB	180-769

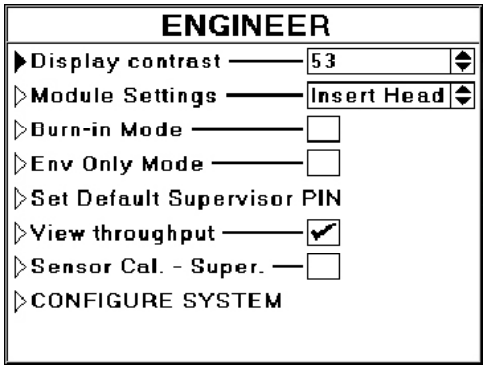
Power Supply Unit

Interlock PCB	180-756

3.13 ENGINEER MODE

3.13.1 100 Series (see 3.13.2 for 140 Series)

Engineer mode can only be accessed by input of the correct PIN. It allows the engineer to test the machine functions and configure the system to reflect the machine hardware and options.

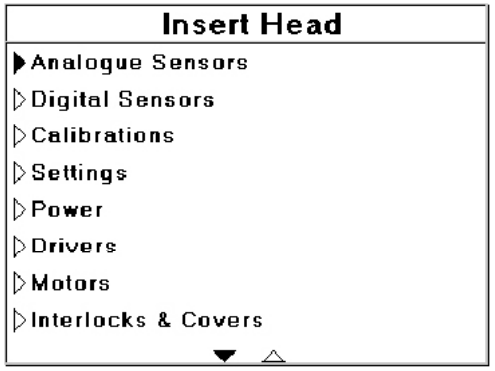


Display contrast

Higher figures enhance contrast to darken display. Default is 53.

Module settings

The following settings are available for the insert head and each track module (numbered 1 onwards) that is fitted and configured. All settings are described below:



Analogue Sensors

These are shown in the format:

abc d.d C or B

The meaning of the numbers is as follows:

a = emitter current value (0 - 9).

b = receiver pot setting value (0- 9). Both 'a' & 'b' are mostly of use only to Technical Support for fault checking in combination with other parameters.

c = threshold voltage value (0 - 9). Should be approx. 4/5

If the values differ substantially from those shown above, the sensor is suspect.

d.dd = receiver voltage in volts. If clear, should be approx. 0.5v. If blocked, should be > 4v.

C / B = clear or blocked

Note: depending upon unit fitted, some sensors may show receiver voltage only, and whether clear or blocked.

These figures are read-only - prior to analysing them, sensors should be auto-calibrated and if any sensor fails, it should first be cleaned and its connector checked. Re-calibrate, and then replace if failure still occurs. The figures may help in fault finding if failure still occurs - contact PFE Technical Support for further assistance.

Digital Sensors

This provides a read-only display of whether the sensor is on or off. If a sensor passes auto-calibration but still gives errors, the paper may be at fault due to transparency. Confirm by inserting a piece of the paper between the sensor halves to check that it passes from clear to blocked. Also remove strong external light sources. Sensors locations are described on the following page. Note: some sensors may differ from those shown, depending on unit configuration.

Insert Head:

Env. Deskew: in front of pickup rollers, centrally located.

Env. Flap: on bracket below env. hopper - open front cover to access.

Fingers Out: on RH side at the end of the finger arm.

Pawl Position: below env. hopper, in RH chain track - open front cover.

Wetter Home: on RH side, below disc.

Fingers Datum & Side Fingers Disc: withdraw finger assy to access.

Side Guide Datum: on RH side, in front of Lenze clutch.

Side Guide Disc: just behind side guide datum sensor.

Main Disc: on RH side, next to env. hopper.

Feeder

Seprtr A & B: visible through chassis cutout on LH side, on separator slide. Open side cover to access

Main Disc: encoder on motor drive disc, on RH side.

Dual Feeder

Hopper 1 Seprtr A & B: on separator slide. Remove cover below hopper to access. Note that Hopper 2 Sep. sensors are analogue.

Main Disc: encoder on motor drive disc, on RH side.

2-Plate Folder

Main Disc: encoder on motor drive disc, on RH side.

3-Plate Folder

Form in Hopper 1/2/3: reflective sensor on bridge at lower end of tray.

Deskew 1/2/3: just in front of pickup rollers.

Daily Post: at bottom of daily post slot.

Accumulator Tray: at lower end of liftable tray.

Divert Bin 1: at top of tray, just before diverter.

Accumulator Index: inside accumulator, detects belt pawl to establish reference.

Stepper Flag: slotted vane disc on stepper motors inside accumulator.

Form in hopper 1/2/3:

FP1/2/3 Disc: slotted vane disc on fold plate motors.

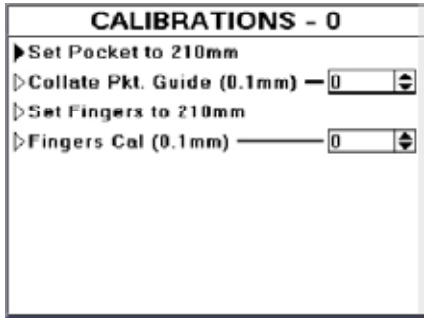
Main Disc: encoder on motor drive disc.

Cardfolder

Geneva 1 Up/Centre/Down: above Geneva mechanism, on LH side.

Main Disc:

Calibrations



This screen applies only to the insert head, and is used to set the collate pocket side guides and the insert fingers to A4 size (210mm). When these options are selected, the motors for the settings will automatically adjust to the correct size. They should then be measured, and any difference should be corrected out using the adjustment boxes - positive numbers increase the width.

Note that the measured distances should be 210mm exactly. Appropriate clearances will then be automatically applied by the software, which will suit most job applications. It it is required to alter the settings, use the adjustment boxes as described above. These settings will then remain until set otherwise.

Note also that the collate pocket side guides are adjustable for taper and are factory set to taper intowards the closer end. The 210mm setting above applies to the narrowest point - the widest point is set to approx. 3-4mm wider either side. Specific jobs may require a diferrent setting; to adjust, slacken the screw near the middle of the guide and twist the guide to suit.

To exit Calibrations, press the 'x' button.

Settings

This allows adjustment of various settings, depending upon the module.

Head end: adjustment of:

Collate Pocket Cal & Fingers Cal: These settings are in addition to any changes made in 'Calibrations'. Use if the settings need to be different from the calibrated sizes.

Wetter Start: Adjusts the point at which the wetter beam drops to wet the flap (+ve = more wetting). In steps of 1mm. **Note:** this setting applies to the machine, and can be further adjusted for the job in 'Advanced'.

Wetter Stop: Adjustment of the point at which the wetter beam lifts (+ve = more flap length is wetted). In steps of 1mm. **Note:** this setting applies to the machine, and can be further adjusted for the job in 'Advanced'.

Envelope Stop Position Cal: Adjusts envelope stop position. Positive = further forward towards exit direction.

Envelope Insert Position Cal: Adjusts amount of insertion of insert pack into envelope. Positive = further forward past flap crease.

Envelope Reverse Position Cal: Adjusts amount of envelope forward travel after flap wetting, before reversing to enter sealing rollers. Positive = further forward into rollers, towards exit direction..

Envelope Seal Position Cal: amount of envelope travel into seal rollers. Positive = further forward, away from exit direction.

Envelope depth Measured: automeasured depth of envelope, which will be displayed. Adjust up or down to suit actual envelope size. Positive = greater.

Envelope flap Measured: automeasured flap length of envelope, which will be displayed. Adjust up or down to suit actual envelope size. Positive = greater.

Ins. Pawl Stop Position Cal: Adjusts stop position of insert pawls behind insert pack in collate pocket. If the pawls are stopped too high by the software, inserts entering the collate pocket will contact the tips, hence position must be adjusted back. Positive = further forward.

Pocket Backstop Cal: As inserts enter the collate pocket, they contact a backstop to prevent overrun, and stop. The backstop is then lowered and the insert drives forward. This setting increases the time delay before the insert drives forward. Use if backstops are slow to drop for any reason, causing crashing. If set to Off, backstop remains lowered always.

Feeders (dual only): Collate Feeder 2 Cal: Moves the form in hopper 2 to adjust collate point. Positive = further forward, in steps of 1mm.

2-Plate Folder: Folplate 1/2 Cal. & No Fold 1/2 cal: These are the same as 1 & 2 of the 3-Plate folder (see below).

3-Plate Folder: adjustment of:

a: auto settings of foldplates 1, 2 & 3. Figure shown will be the setting for the job, and may be adjusted if required. Units are 0.1mm and positive = greater. To set up for the first time, or if parts have been replaced:

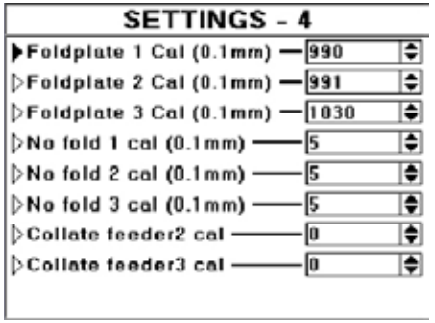
1. Set up a job with the following parameters:

European: Envelope = C5 (162 x 229), Paper = A4 single sheet from top hopper, Fold = V.

US: Envelope = No. 7 Booklet (159 x 244), Paper = Letter size single sheet from top hopper, Fold = V.

2. In the edit screen for the document, go to 'View fold settings'. For A4, Length A should be 148mm and length B 149mm. For Letter, Length A should be 140mm and Length B 139mm.

3. Save the job and run. Measure the length of the first panel, which should be 148mm (A4) or 140mm (Letter). If not, adjust 'Settings' as described below:


SETTINGS - 4
Foldplate 1 Cal (0.1mm) 990
Foldplate 2 Cal (0.1mm) 991
Foldplate 3 Cal (0.1mm) 1030
No fold 1 cal (0.1mm) 5
No fold 2 cal (0.1mm) 5
No fold 3 cal (0.1mm) 5
Collate feeder2 cal 0
Collate feeder3 cal 0

4. If the measured length were to be, for example, 153mm for A4, enter 1530 in Foldplate 1 Cal (steps = 0.1mm). The software will then subtract this difference to correct the folplate setting.

5. Run the job to check the length is now correct (148mm in this case).

6. To calibrate foldplate 2, return to the job and enter 'View fold set tings/Advanced'. Set foldplate 1 to 'not used' and repeat steps 3 to 5, entering the figure into Foldplate 2 Cal if it is wrong.

7. Repeat for foldplate 3, except that both foldplates 1 & 2 are set to 'not used', and an incorrect figure is entered into Foldplate 3 Cal.

b: calibration of no-fold blanking beams 1, 2 & 3. Adjusts gap between tip of beam and fold roller. If forms are not entering a fold plate when they should, gap must be increased and vice versa. Units are 0.1mm of motor actuator which equates to 1mm at beam tip. Positive numbers only.

c: alignment of leading edges when collating before feeding. Applies to feeders 2 & 3. Units are 0.1mm and positive = further forward.

Cardfolder: adjustment of:

FP1 Up Cal: Controls paper travel into FP1 in 'up' position. Positive = further. Factory default = 4. (Mk.1/2).

FP1 Down Cal: Controls paper travel into FP1 in 'down' position. Positive = further. Factory default = 0. (Mk.1/2).

FP2 Up/Down Cal: As for FP1. Factory defaults = 0 & 0. (Mk.1 only).

FP2 Clockwise Cal: Controls paper travel into FP2 for CW rotation, (from operator side). Positive = further. Factory default = 0. (Mk.2 only).

FP2 Counter CW Cal: Controls paper travel into FP2 for CCW rotation, (from operator side). Positive = further. Factory default = 0. (Mk.2 only).

Up Detent CW: Controls detent landing position for cassette home position. Positive increases rotation. Factory default = 0. (Mk.2 only).

Down Detent CW: Controls detent landing position for cassette after 180° rotation. Positive increases rotation. Factory default = 0. (Mk.2 only).

Up/Down Detent Counter CW: As for CW, but rotating Counter CW. Factory defaults = -4 & -3. (Mk.2 only).

Conclusion of Settings section.

Power

This provides a read-only display of voltages and currents of various supply sources. The voltage/current readings are displayed to two decimal places.

Drivers

Allows various components to be switched on or off to test them and provide a readout of current rating. Components shown will depend upon type of unit selected and will include some or all of: clutches, brakes, solenoids and indicator LEDs. Drive motor is also included for each module, as this must be switched on to test some other components.

Motors

This allows you to switch motors on or off to test them and provide a read-out of current rating. Motors shown will depend upon type of unit selected and will include some or all of: accumulator stepper, insert fingers, collate pocket and foldplates.

Interlocks & Covers

Reports on state (open or closed) of covers and interlocks (feed trays present) for each unit. Use this to test for deficient switch or magnet.

OMR/Barcode Setup (Feed Units only)

Currently a null function.

Burn-in Mode

If this is selected, when Engineer mode is exited and the machine is run, it will operate indefinitely using the last selected job. Remove all stationery first. Switch to another job if required, and burn-in will then operate with those job parameters. **Note that burn-in does not increment the total machine count.**

Env Only Mode

Allows machine to run with envelopes only, to help fix envelope problems.

Set Default Supervisor PIN

Allows the Supervisor PIN to be set to its system default of 123. Use this feature if the Supervisor PIN has been changed and then forgotten. The PIN is changed by the user in Supervisor menu.

View throughput

If deselected, suppresses 'output per hour' rate on display when running. Use when conditions require output rate not to be shown.

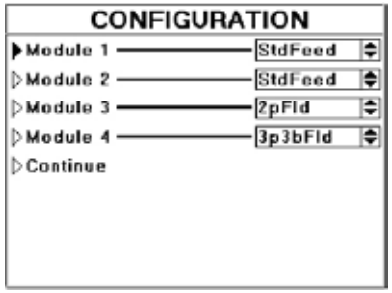
Sensor Cal. - Super

If selected, adds analogue sensors to Supervisor menu to allow calibration.

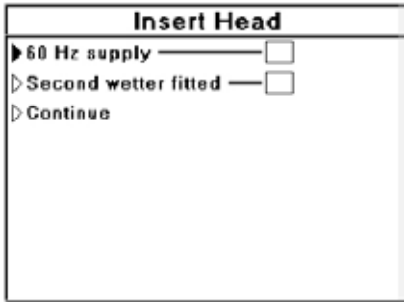
Configure system

Before the machine is able to operate, it must first be configured to reflect the actual hardware setup. For example, if the last station is a 3-bin, 3-plate folder, this must be configured to reflect this.

Use the drop down lists to select the appropriate modules, as shown below.



If modules are changed or added at later date, the machine must be configured again to reflect the hardware fitted, or it will not be recognised. After selecting the module, select 'Continue' to move to the setup screen for the Insert Head, as shown opposite.

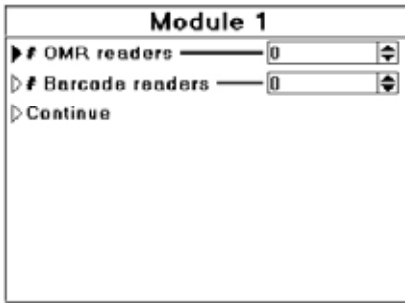


Insert Head

Select '60Hz supply' only if the machine is 110v.

Select 'Second wetter fitted' if the machine uses a high capacity wetter with a second wetter pump and drum of fluid in the stand.

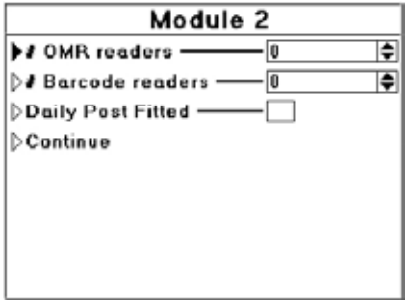
When finished, select 'Continue' to move to the next module, as shown below.



Feeder (Standard, Dual & OMR/Barcode)

If the unit is an OMR/Barcode feeder, select the number of OMR and Barcode readers. A maximum of **either** 4 x OMR **or** 1 x Barcode readers can be fitted. For standard or dual feeders, leave these options unselected.

When finished, select 'Continue' to move to the next module.

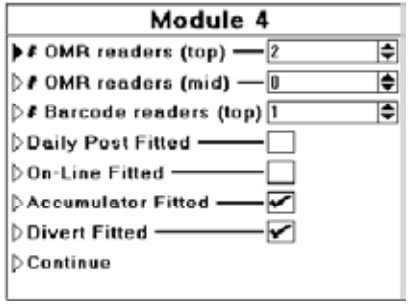


2-Plate Folder

If the unit is reading OMR or Barcode, select the number the of readers up to a maximum of **either** 4 x OMR **or** 1 x Barcode readers.

If the Daily Post option is fitted, tick this box. When operating, the machine will then wait for manual insertion of forms in the handfeed tray.

When finished, select 'Continue' to move to the next module.



3-Plate Folder

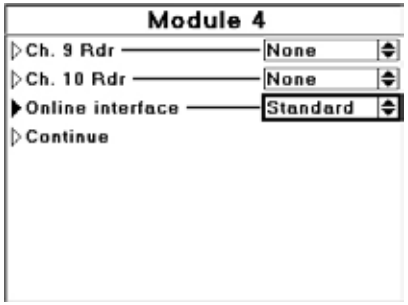
If the unit is reading OMR or Barcode, select the number of readers up to a maximum of **either** 4 x OMR **or** 1 x Barcode readers on the top tray, or 4 x OMR readers on the middle tray. Read heads can be either top or bottom reading.

If using Daily Post, tick this box. When operating, the machine will then wait for manual insertion of forms in the handfeed tray. Other forms from the 3 trays may be collated with it.

If the machine is being fed from an on-line source, select the 'On-line Fitted' option.

Select 'Accumulator Fitted' and 'Divert Fitted' if either of these is present.

When finished, select 'Continue' to move to the next module.



Cardfolder

Select if an online interface is fitted, allowing the cardfolder to be automatically fed from a card processing device.

Select number of OMR or Barcode readers fitted, if applicable.

For Online Interface, select 'Standard' or 'Std Inv Bsy' (the opposite) depending on signal supplied by card processor. For 'Standard', green LED on interface PCB is on when busy; 'Std Inv Bsy' is opposite. Red LED indicates cardfolder disabled or unavailable for both 'Standard' and 'Std Inv Bsy'.

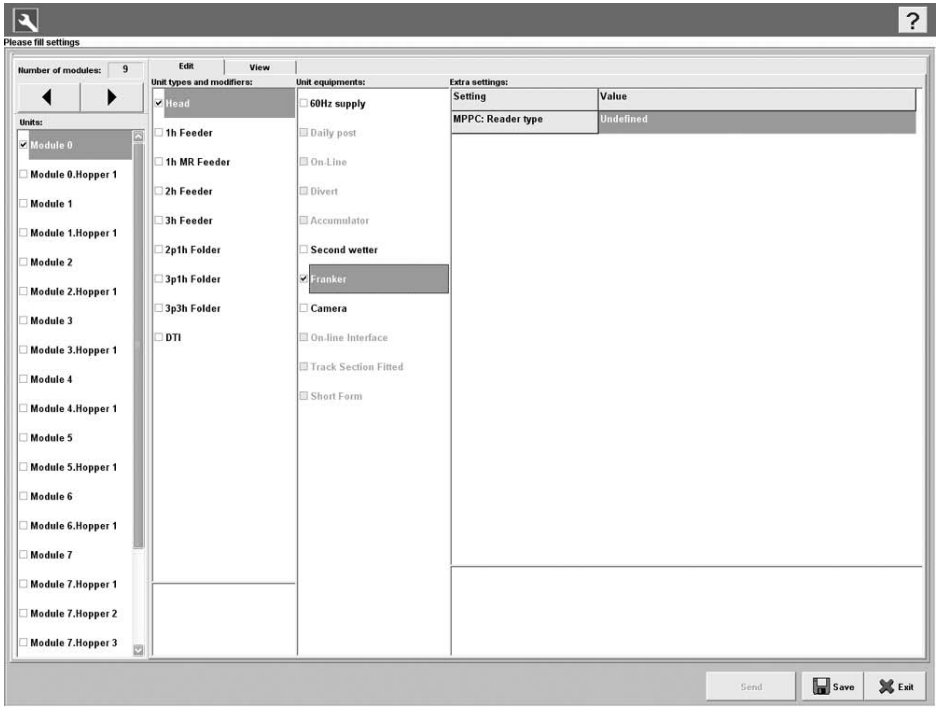
When finished, select 'Continue' to move to the next module.

When all settings for all units have been made, select 'Continue' – you will be prompted to save your changes. The machine is now configured and ready for use.

3.13.2 ENGINEER MODE (140 SERIES)

Engineer mode for 140 Series makes available the same features as for standard 100 Series. Therefore, the explanations for each feature described for Maximailer should be used, in conjunction with the following explanation of which of the features are found in the four engineering screens (Hardware setup, Units setup, Firmware download & Diagnostics). There is also the further function 'Plug & play', described at the end of this section.

Hardware Setup: Configures physical machine, equivalent to 100 Series 'Configure System'. To make changes, check the 'Edit' box.



Click on each unit in the list shown above and the unit type will be shown, and the equipments currently used. If making changes (eg. adding an accumulator or an OMR head to a 3 plate folder), select these to suit. The number of OMR or barcode heads can be set in 'Extra settings'. After making changes, press the 'Send' button to update the firmware and INI file.

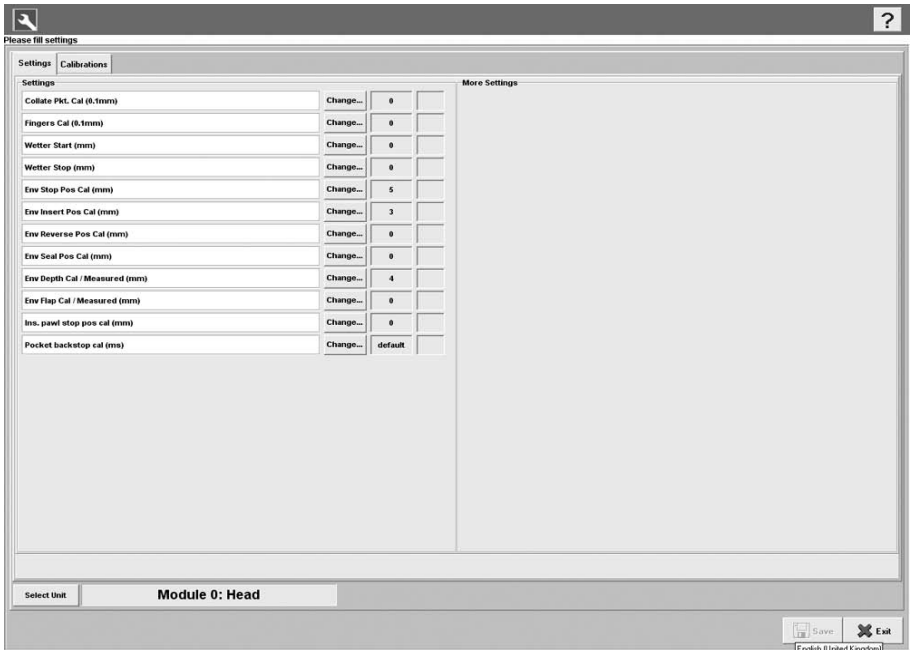
When adding or removing a module, it is possible to use the upper arrows to add or subtract modules to reflect the physical machine. As changes will always be added or removed at the end of the list shown above, all stations after the altered one will need to be re-defined. In practise however, when a

module is added or removed, provided DIP switches have been correctly set (see section 1.3), the machine will automatically detect changes at power-up and restructure the above list, as described in 'Plug & Play' at the end of this section.

The 'View machine' and 'View INI' buttons allow the module information stored in the firmware to be compared with the information in the INI file on the computer; these should match. This is a read-only function, as Plug & Play will allow module settings to be restored if physical changes are made.

When finished, save changes and exit.

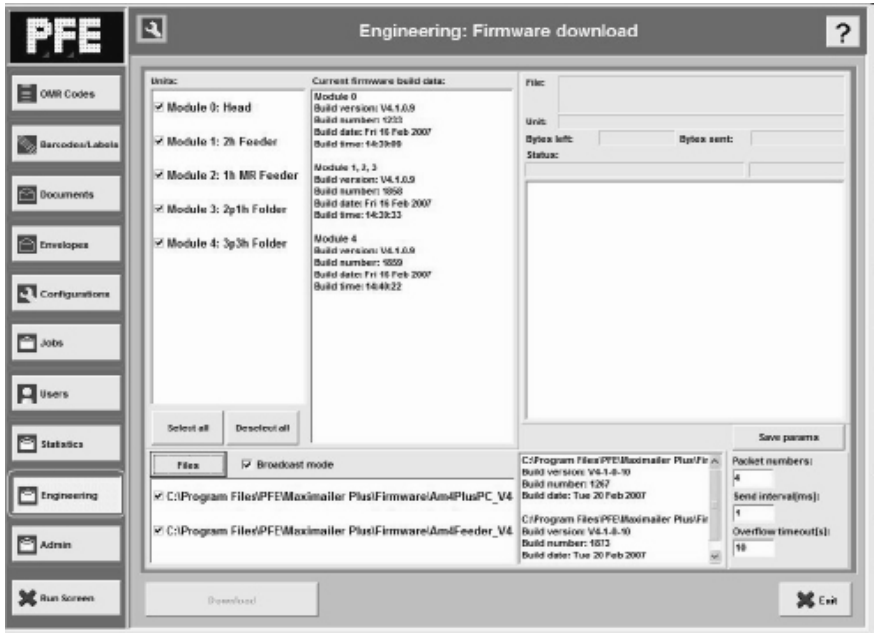
Units Setup: Equivalent to 100 Series 'Settings'. Select each module in turn to make any changes. Note that Calibrations apply only to insert head and are equivalent to 100 Series 'Calibrations'. After making a change, press 'Apply'.



When finished, save changes and exit.

Firmware Download: Firmware downloading allows selected units to be upgraded with selected files, usually sourced from the company website. Select the unit(s) to be upgraded and use the 'Browse' button to find the appropriate .am4 file(s). Note that each file includes the module name in the filename, ie. for head, 3P folder or feeder/2P folder/Cardfolder. The lower windows show the version number and status of the file. These can be compared with the centre window showing the same details for the current firmware in the unit.

When downloading, the righthand window shows download status in progress.



Use 'Change Params' for **existing firmware higher than 4.1.0.0c** as follows:

	PCI CAN	USB CAN
Packet	19	4
Send Interval	1	1
O/Flow Timeout	10	10

Press 'Save Params' to save. For existing versions prior to 4.1.0.0c use Trace Tools for upgrading, as per 100 Series (see 3.14.3).

Broadcast Mode: This allows multiple feeders/2P folders/Cardfolder to be upgraded simultaneously, saving time. **It should be used only on existing versions higher than 4.1.0.0f.**

Diagnostics: These are identical to 100 Series Module Settings. Note that the tab marked 'Solenoids' is equivalent to 100 Series 'Drivers' and 'Covers' is the same as 'Interlocks & Covers'.

Press 'Get Currents' to fill the boxes with the current drawn for each item (this takes about 1 minute). As each component is switched ON, the total current is shown in the status box at the bottom. Currents apply only to Solenoids and Motors tabs (note that there is no 'Get current' button for Motors). Foldplate motors can be run in both directions.

Exit the screen when done.

Plug and Play: On power-up, or if 'Plug & Play' is pressed, the software determines how many modules are fitted, which module types, and any calibration information. This is the **detected** machine configuration. The detected machine configuration is then compared with the programmed machine configuration in the INI file. If there is a mismatch, the user is given the option to accept the detected configuration, accept the current programmed configuration, or go to the engineer setup screen and edit the current configuration.

The key benefits are

- if a module is added, removed or changed to a different type, the new configuration will be detected and can be readily updated.
- if a board is changed on the head or module, the new board will be detected and settings can be readily restored from the INI file of the PC.
- if a new PC is fitted, the configuration can be 'read' from the machine.

IMPORTANT : DIP switches must be correctly set to the module address on power-up – see section 1.3.

3.14 TRACE TOOLS

Firmware downloading and debugging on the 100 series (not 140) requires the use the Trace Tools utility. This runs on a PC/laptop and is connected to the machine via serial port. The utility can also be used for Engineer settings, machine configuration and job configuration, though these should normally be carried out on the GUI for non-PC versions of the machine, and using the operating software for PC versions. Another built-in function is OMR scope analysis for troubleshooting OMR problems.

3.14.1 Connecting the machine

To connect the computer to the machine, an adaptor box 184-176 will be required (note that the lead is specific to Automailer 4). The adaptor box plugs via a DIN/'D'type lead into the COM port on the computer, and the serial lead then connects to the debug connector next to the mains socket (see Fig. 17 below).

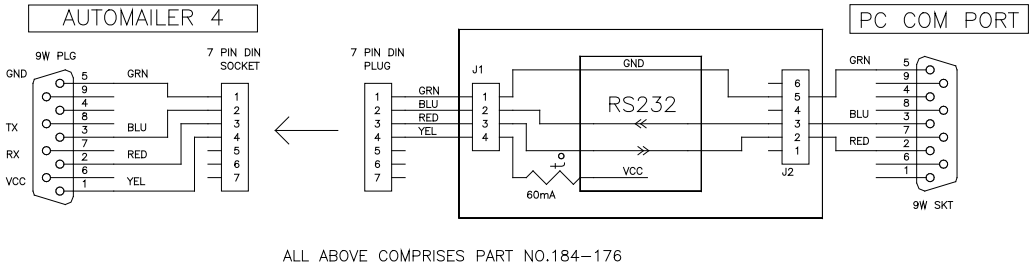


Fig. 17

With the computer connected as above and the machine switched on, start Trace Tools. This will display the RX screen shown in Fig. 18 opposite, showing data received from the machine. Select 'ComPort' from the menu bar and ensure that the correct port is selected (usually COM1), or select 'Config' to choose your own, more advanced, port settings to suit specific purposes.

Note that other function buttons are duplicates of functions found in Engineer mode of the GUI software and should not normally be used; use the GUI version instead (see also section 3.14.4).

3.14.2 Debugging

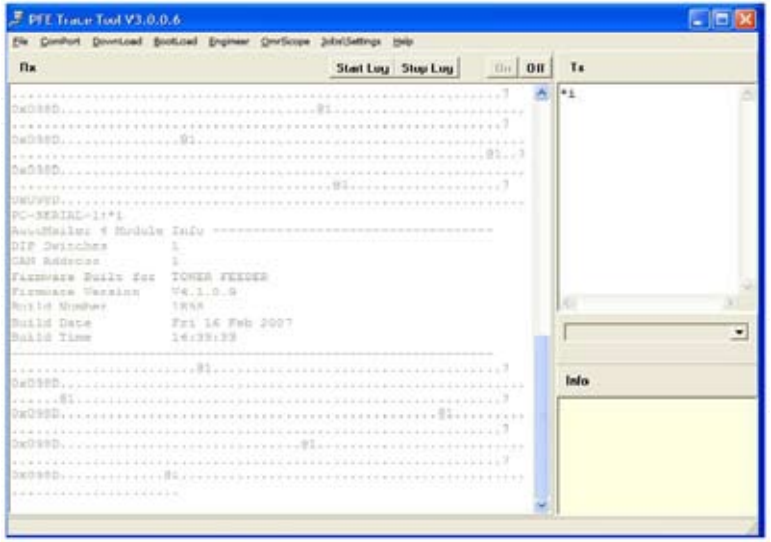


Fig. 18

Fig. 18 above shows the initial status of the job after first switching on and selecting the job from the job menu. When the machine is running, the operating software code will be shown scrolling on the screen. When trying to trace operating problems, this data will be of limited use unless the engineer is familiar with the code; the preferable course of action will be to capture the text and send this to Technical Support for analysis. To capture a trace, press 'Start Log' and select a directory for the logfile. Run the machine until the problem occurs and press 'Stop Log'. The logfile generated can then be sent to Technical Support. To pause the trace momentarily for closer examination of a specific part, press 'Off'; press 'On' to resume. While the trace is paused, a selected area can be copied, then pasted into Notepad to create a file.

3.14.3 Downloading firmware

Upgrading of firmware is carried out for each module of the machine - insert head, feeder/folder & 3-plate folder. All of these can be upgraded directly to each module separately, or collectively via. the serial connection on the insert head. Direct upgrades should be used on existing firmware up to and including V4.1.0.0f , or if a new PCB is fitted in field, when boot information may not be loaded in the EEPROM. Later firmware can be upgraded via the head. Prior to downloading the upgrade files, they must be present on the PC and are normally obtained from website download.

Directly to each module separately

To carry out the upgrade, select 'Download' from the menu bar, then 'Direct'. This will open the Download Direct dialog box, then click the '...' button to open the file selector dialog and select the appropriate file for download; this will be a .am4 format file.

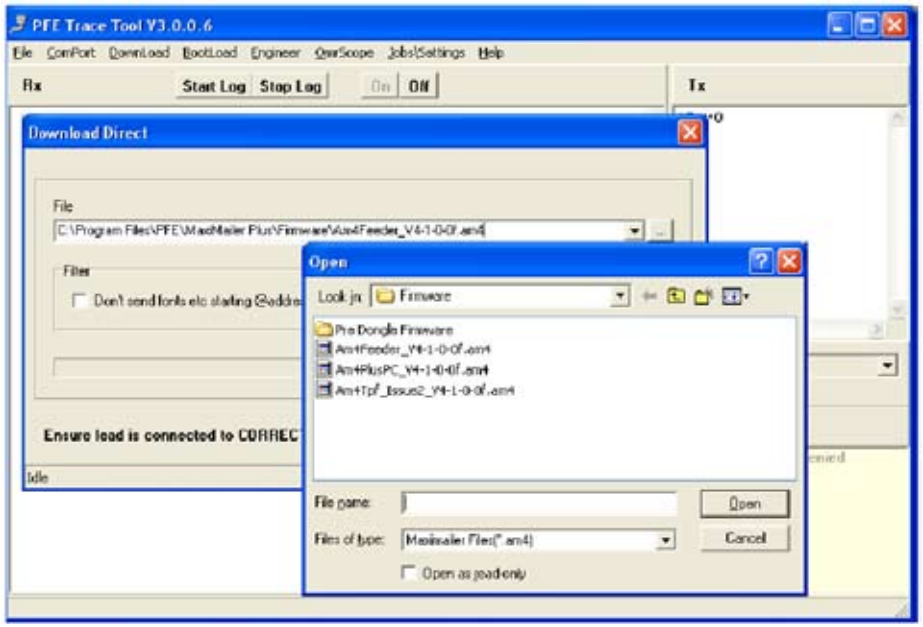


Fig. 19

Note that a separate file exists for each module type and carries a descriptive name. Select the appropriate file and click 'Start'. A status bar will show the progress of the download which may take a few minutes for the insert head and less for feed units. Correct progress of the download is confirmed by continuous '+' signs displaying in the RX screen of Am4Go. Any errors will be displayed in the Info window in the bottom RH corner.

Important: When connecting the adaptor to the module, this will plug directly into the serial connector on the PCB. This means that the DIN to 'D' type lead on the adapator will not be suitable; use the DIN to PCB connector lead instead (this is supplied with the adaptor kit 184-176). The serial connectors on the respective PCBs are as follows:

Insert Head	J14
Feeder/2-Plate Folder/Cardfolder	J19
3-Plate Folder	J21

Via Head (for existing versions higher than 4.1.0.0f)

To carry out the upgrade, select 'Download' from the menu bar, then 'Via Head'. The same file select dialogs will appear as with direct downloading; the difference being that each module can be upgraded through the connector on the head, without the need to remove covers and connect to the PCBs. Note that if a new PCB is fitted in field, the direct method must still be used.

Bootload

Bootloading is a similar process to downloading and uses the same files. Under normal circumstances should not need to be used. However, if problems occur when downloading, bootloading may well be more successful. Symptoms of such problems would be, for example, absence of trace of '+' signs in the RX window when attempting to download, or the indicator LED on the PCB failing to flash when the machine is switched on. If after bootloading the PCB is still malfunctioning, contact Technical Support.

To use bootload, fit a jumper to JP1 to the PCB on the relevant unit, then reset by either pressing the reset button on the PCB or switching off/on. Select Bootload from the menu bar and follow the same process as for downloading.

3.14.4 Engineer Mode

Engineer mode is available from the menu bar, and is a duplicate of Engineer in the GUI software. This should normally be used in preference, but the use of Trace Tools may offer greater convenience if the computer is connected anyway.

To use Engineer, select it from the menu bar and choose the required module. Use the tabs to select the area concerned (solenoids, sensors, currents etc.). Fig. 20 below shows an example display for the feeder - for a full explanation of the Engineer functions, see section 3.13 of this manual.

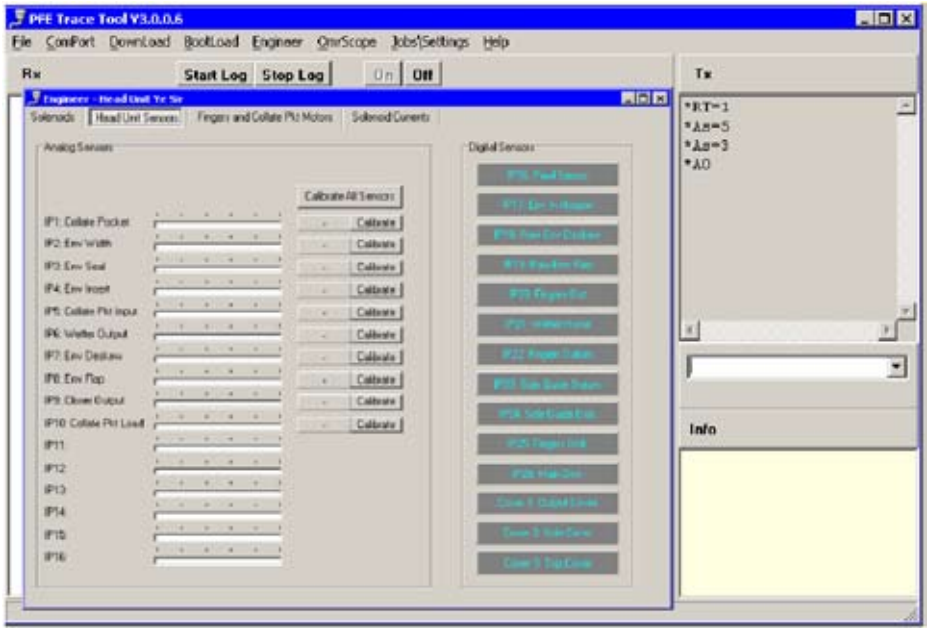


Fig. 20

3.14.5 OMR Scope

The OMR scope function is available on the menu bar and can be used for analysing OMR problems. It displays the trace of the output from the OMR reader for up to the most recent 10 document reads (see Fig. 21 below).

Notes:

a) Before using the scope to trace OMR problems, ensure the reader is correctly installed and set up, as described in section 3.16.

b) The computer must be connected directly to the OMR-reading unit (usually a 3-plate folder) - see section 3.14.1 for details of connecting to the machine.

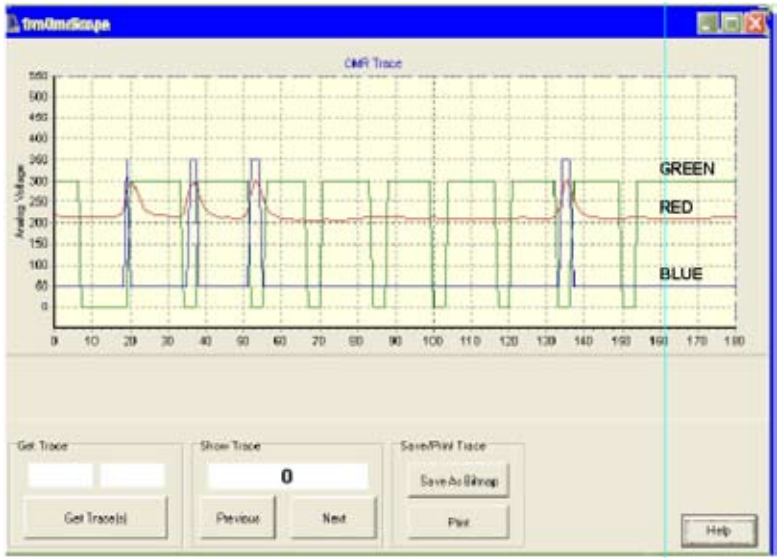


Fig. 21

Usage

Wait until the machine comes to rest, then click the 'Get Traces' button. This will retrieve up to the 10 most recent traces captured by the module electronics. Trace 0 is the most recent document. Click on the 'Previous' and 'Next' buttons to step through the 10 most recent documents.

cont.

Interpreting the traces

The red trace is the signal from the OMR head. This is low when the head reads white paper, high when it reads a black OMR mark.

The green trace shows where the software 'opens a window' of time to look for a mark. The window is 'open' when this signal is low. The peaks of the other two traces must occur within this window for the mark to be read.

The blue trace goes high to indicate that a mark has been detected. It should peak at about the same time as the red trace.

What to look for

The base of the red trace trace should ideally be below 200 on a plain white paper background. A low base level indicates good head sensitivity.

Marks will appear as humps on the red trace. This hump should be greater than 50mv on the voltage scale. Small humps could be due to poor print quality/contrast or an insensitive OMR head.

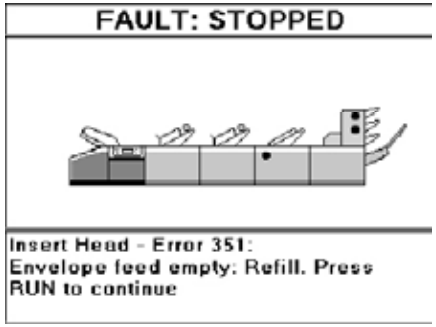
On a plain background, the base of the red trace (ignoring the humps) should be fairly flat. Ripples of more than 25mv indicates that the paper is flapping under the OMR head.

Saving the trace

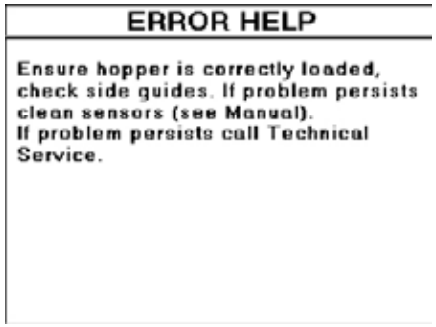
The trace can be saved as a bitmap to your chosen location by clicking 'Save as Bitmap'. This can be used for later analysis or for sending to Technical Support, should this be necessary. The trace can also be printed, assuming a printer is connected to the computer.

3.15 ERROR CODES

A number of error codes and messages are programmed into the machine to cater for all potential operating faults. If an error occurs, the machine will stop and display the problem. The machine graphic on the display will flash the appropriate area of the machine, for example:



If the ? button on the control panel is pressed, further help will be displayed to assist in correcting the problem, as shown below.



Due to the large number of error codes, these are not listed in the Service Manual but are available as a separate document 'Maximailer Error Codes', which can be downloaded from the company website. Note there are different versions of this doccument, according to firmware version.

3.16 FITTING AN OMR HEAD

Machines not fitted with OMR can be upgraded to full OMR specification by ordering the appropriate kit of parts:

A3247A	3-Tray 3P Folder, OMR on Station 1 only
A3248A	3-Tray 3P Folder, OMR on Stations 1 & 2 (cascade)
A3266A	Single Tray 3P Folder

Also available is A3261A, OMR Head & Foot Kit. This comprises the OMR head together with the aluminium foot with spring-loaded nylon shoe. The full upgrade kits also include all brackets, sliders and slider bars.

3.16.1 3-Tray 3P Folder, OMR on station 1 only (Kit A3247A)

Fig. 22 below shows the assembly of the parts prior to fitting to the machine. If not already built when received, assemble parts now (Tower OMR Bar C9382A with head/foot assembly fits into the Tower Access assembly, as described later). Note that top read is shown - if bottom read is required, swap over the positions of the OMR head and foot assembly opposite. The location along the bar of the OMR head depends upon the required approximate position to align with the marks on the paper. Wherever it is located, the sliders C6223A should be roughly evenly distributed about it.

cont.

LIST OF OMR READER POSITION OPTIONS	
PART No.	DESCRIPTION
A3–0375–OBL	OMR TRAY 1 BTM. LEFT
A3–0375–OBR	OMR TRAY 1 BTM. RIGHT
A3–0375–OTL	OMR TRAY 1 TOP LEFT
A3–0375–OTR	OMR TRAY 1 TOP RIGHT

LIST OF 2–TRACK READER POSITION OPTIONS	
PART No.	DESCRIPTION
A3–0375–TBL	TWIN OMR TRAY 1 BTM. L
A3–0375–TBR	TWIN OMR TRAY 1 BTM. R
A3–0375–TTL	TWIN OMR TRAY 1 TOP L
A3–0375–TTR	TWIN OMR TRAY 1 TOP R

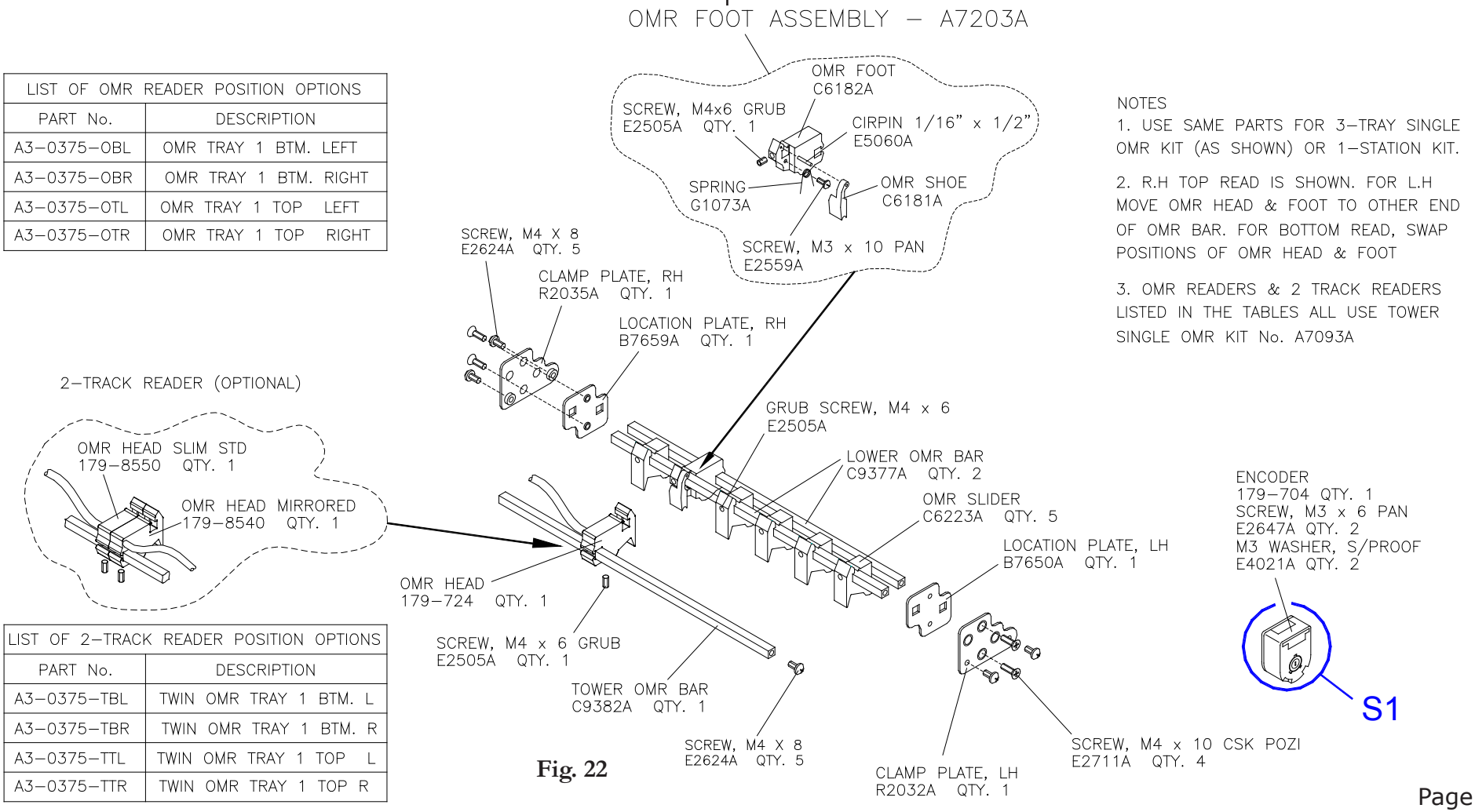

OMR FOOT ASSEMBLY – A7203A
OMR FOOT C6182A
SCREW, M4x6 GRUB E2505A QTY. 1
CIRPIN 1/16" x 1/2" E5060A
SPRING G1073A
OMR SHOE C6181A
SCREW, M3 x 10 PAN E2559A
SCREW, M4 X 8 E2624A QTY. 5
CLAMP PLATE, RH R2035A QTY. 1
LOCATION PLATE, RH B7659A QTY. 1
2–TRACK READER (OPTIONAL)
OMR HEAD SLIM STD 179–8550 QTY. 1
OMR HEAD MIRRORED 179–8540 QTY. 1
GRUB SCREW, M4 x 6 E2505A
LOWER OMR BAR C9377A QTY. 2
OMR SLIDER C6223A QTY. 5
LOCATION PLATE, LH B7650A QTY. 1
OMR HEAD 179–724 QTY. 1
SCREW, M4 x 6 GRUB E2505A QTY. 1
TOWER OMR BAR C9382A QTY. 1
SCREW, M4 X 8 E2624A QTY. 5
CLAMP PLATE, LH R2032A QTY. 1
SCREW, M4 x 10 CSK POZI E2711A QTY. 4
ENCODER 179–704 QTY. 1
SCREW, M3 x 6 PAN E2647A QTY. 2
M3 WASHER, S/PROOF E4021A QTY. 2
S1
NOTES
1. USE SAME PARTS FOR 3–TRAY SINGLE OMR KIT (AS SHOWN) OR 1–STATION KIT.
2. R.H TOP READ IS SHOWN. FOR L.H MOVE OMR HEAD & FOOT TO OTHER END OF OMR BAR. FOR BOTTOM READ, SWAP POSITIONS OF OMR HEAD & FOOT
3. OMR READERS & 2 TRACK READERS LISTED IN THE TABLES ALL USE TOWER SINGLE OMR KIT No. A7093A

Fig. 22

Fitting the OMR assembly to the machine

1. Remove the RH side cover and the tower access assy front & top cover (the tower access assy is the pivoting section at the top front of the tower).
2. Remove tower access assy (this is not essential, but is quick to do, and greatly improves access). The pivot bar is retained with a screw at each end, and a nylon strap.
3. On the RH side, remove the jockey gears shown in Fig. 23. This provides access to the end of the transport roller shaft and OMR plate scews.

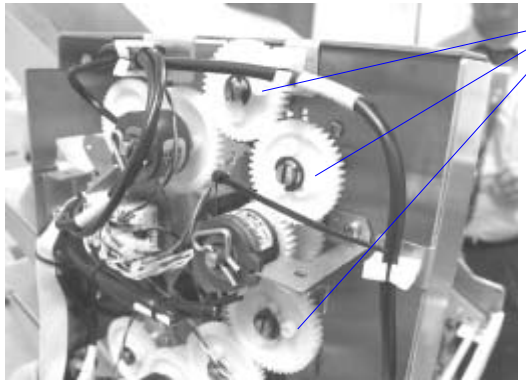


Fig. 23

4. Remove the 'E' clips, 'T' bearings and springs from both ends of the transport roller shaft and lift it out of the chassis. In its place, fit the OMR transport roller shaft A2844A, supplied in the kit. Assemble this with the nylon encoder mount P2150A in place of the 'T' bearing on the LH end. Note that the stepped end of the shaft runs through this mount.
5. Assemble the encoder base plate to the nylon mount using 2 off M3 x 6 screws & lockwashers (see Fig. 22). On the encoder cover, align the small grub screw hole with the slot on the curved part of the cover and insert the Allen key (this is normally supplied with the Allen key in place). Clip the cover onto the base and tighten the grub screw onto the end of the transport shaft. Pull out the Allen key and turn the adjustor slot fully clockwise to position 2. **Note:** when the encoder cover has been clipped in place, it cannot then be removed.
6. Connect the supplied encoder cable 182-703 from the encoder to the upper Splitter PCB. Wires are connected BLK/WHT to J1, RED/BRN to J2.
7. Fit the supplied emitter (RED/BLK wires) to the sensor mount on the supplied OMR bridge B7649A. Remove the existing paper transport bridge below the transport roller shaft - the OMR bridge will fit in its place after fitting the OMR assembly (Fig. 25 on the following page shows the OMR bridge in place).
8. Fit the OMR assembly and retain it with 2 screws each side on the outside of the chassis, as shown in Fig. 24 below. If the OMR head is fitted to the assembly, lead the cable through the chassis bush shown in Fig. 24. Retain the cable through existing clips and connect to J14 (OMR 1) on the main PCB.

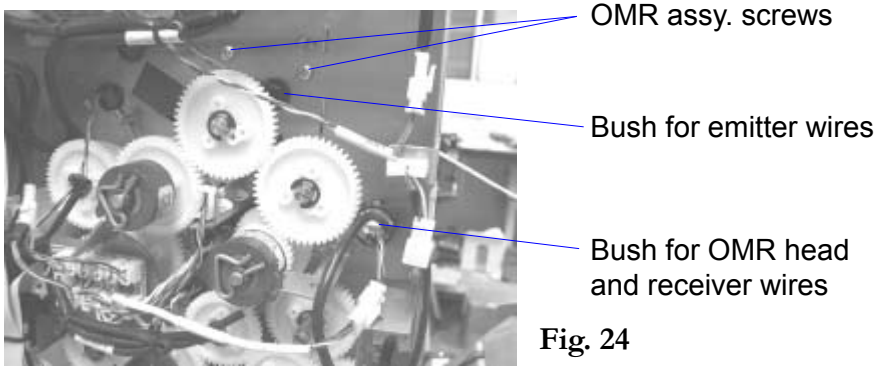


Fig. 24

9. Fit the OMR bridge B7649A, leading the emitter wires through the bush shown in Fig. 24. Connect to J8 on the upper splitter PCB. Slacken the grub screw on each OMR slider and align them as far as possible with the rubber bands on the roller, as shown in Fig. 25 on the following page.

Important: If centre OMR marks are being used, OMR Bridge B3-1366-A must be fitted in place of the standard item.

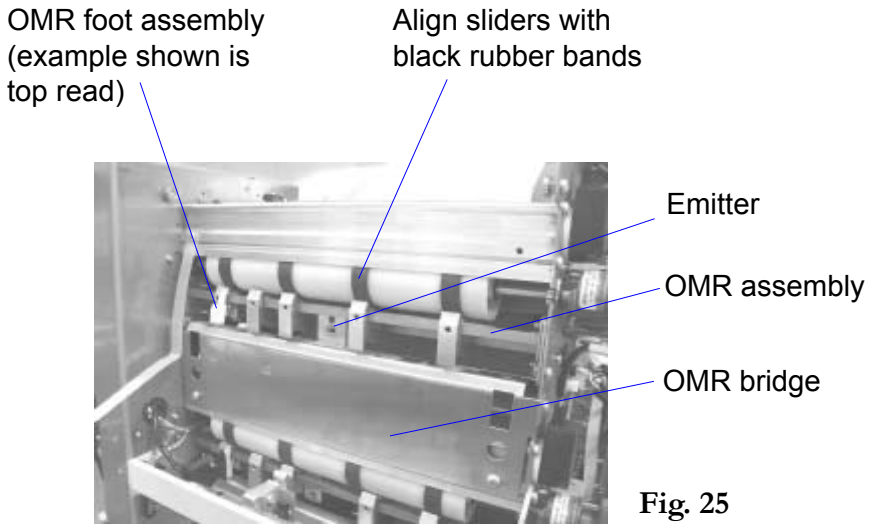


Fig. 25

Tower Access Assembly

10. Referring to Fig. 26 below, remove the existing access bridge. Fit the square slider bar C9382A, as shown in Fig. 22, after sliding on either the OMR head for top read, or foot assembly for bottom read. If fitting the OMR head, lead the cable out through the bush adjacent to the pivot.

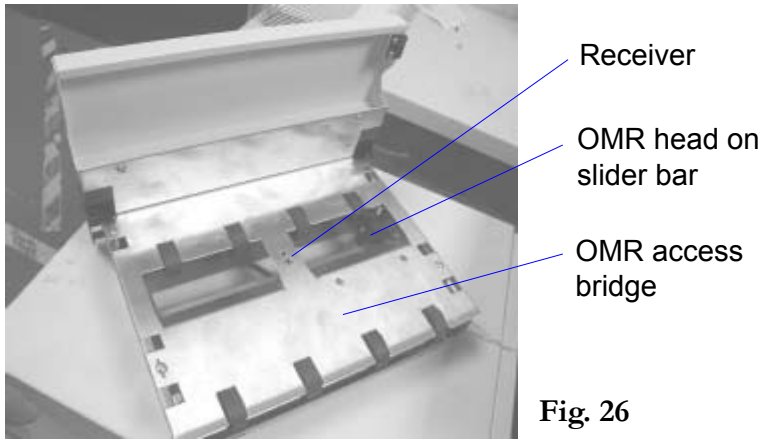


Fig. 26

Note: Shown fully reassembled.

11. Fit the supplied receiver sensor to the OMR access bridge. Also fit the 2 supplied 'P' clips using M4 nuts & washers, then feed the wires through the clips.

12. Assemble the OMR access bridge to the tower access assembly, leading the receiver wires through the bush adjacent to the pivot. Refit the top cover. The assembly should now look as shown in Fig. 26.

    Important: If centre OMR marks are being used, OMR Access Bridge B3-1365-A must be fitted in place of the standard item.

13. Reassemble the tower access assembly to the machine, leading the receiver/OMR head cables through the bush shown in Fig. 24. Ensure the restraining strap on the assembly is in place. **Note: if station 2 OMR (cascade) is also being fitted, do not fit the assembly at this stage. See section 3.16.2 for fitting cascade OMR.**

14. If the OMR head is fitted to the assembly, retain the cable through existing clips and connect to J14 (OMR 1) on the main PCB. Connect the receiver to the supplied link cable 182-622 and connect this to J7 on the upper splitter PCB.

15. Align the OMR head to suit the marks on the paper, with the sliders evenly distrubuted, as shown in Fig. 22. The grub screw for retaining the OMR head tightens onto the slider bar which attaches the head to allow access for adjustment.

    To align the head for bottom read (head fitted to tower), mark the edge of the reverse side of the paper to align with the centre of the marks (either single or 2-track). Wind the paper into the hopper by turning the pickup roller and the green knob. Slacken the grub screw and slide the head to align the marks as shown in Fig. 27 (note that 2-track heads have an alignment mark).

    To align the head for top read, (head fitted to opening cover), open the cover and remove the inner cover plate to provide access to the grub screw; unclip the gate sensor as it is withdrawn, and be careful not to open it too far with the restraining strap removed. Now remove the hopper tray and move the OMR shoe in the tower unit out of the way so the OMR head is visible by looking through the tray aperture. Wind in the paper and align the head using the same principle as for bottom read. When aligned, move the OMR shoe back so that it is opposite the OMR head and distribute the sliders evenly. Tighten all grub screws and replace the cover plate when finished.

    Note: the OMR reader is not central within the window - the centreline of the marks must align with the head as shown in Fig. 27 on the following page.

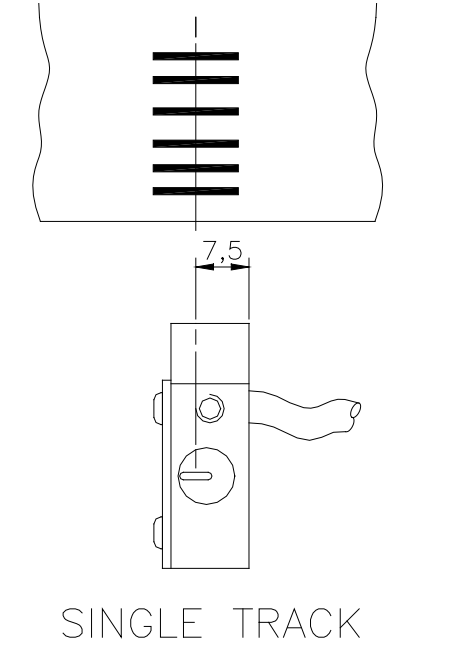


Fig. 27

OMR channels

16. The machine can support up to 4 OMR heads in any combination. The heads are assigned a channel number in the software, which can be changed if required. The channel number equates directly with the PCB connector that the head is plugged into - see Fig. 28 below:

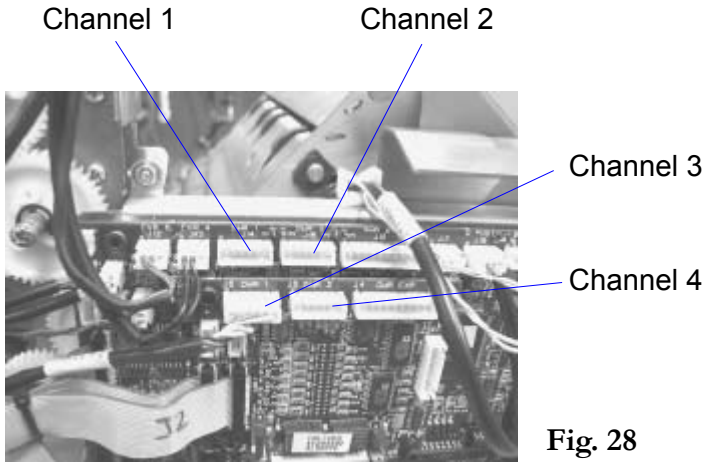


Fig. 28

17. Note that channels 3 & 4 are located on the expansion PCB - this will only be fitted for machines with more than 2 OMR heads fitted, or for cascade machines, ie. 3-tray units (see section 3.16.2 for cascade OMR).

    The read head IDs are identified as 1 and 2 on both top and middle trays (viewed L & R, from behind respectively). Top tray ID 1 is connected to channel 1, ID 2 to channel 2. Middle tray ID 1 is connected to channel 3, ID 2 to channel 4. This should be followed whether there is 1 read head or 2 on each tray.

    Twin read heads

    If twin heads are fitted for 2-track OMR, these can be fitted on the top or middle tray (but not both). They are connected to channels 1 & 2 on the top tray (179-8540 to channel 1, 179-8550 to channel 2), or to channels 3 & 4 on the middle tray (179-8540 to channel 3, 179-8550 to channel 4).

    See also connection diagram at 3.17.1, fig. 43.

DS-100 Configuration (see 2.5 for DS-140 configuration)

18. The machine must now be configured so that the OMR or barcode reader is recognised.Switch on and enter Engineer mode. In 'Configure System', repeatedly select 'continue' until the settings for the OMR reading unit appear. Assign readers by channel number, as shown in Fig. 29 below. (Ch. 1-4 are for OMR, Ch. 9 & 10 for barcode/2D - see also connection diagram at 3.17.1, step. 11).

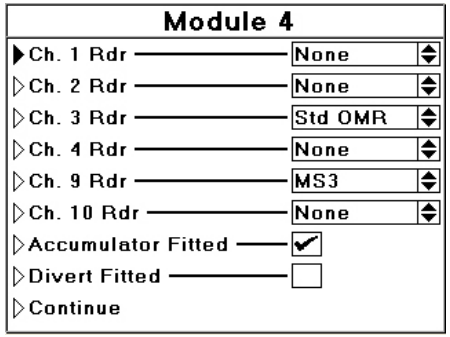


Fig. 29

19. Enter 'Module Settings' in Engineer mode and select the relevant OMR or barcode reading unit(s). Calibrate OMR Gate 1 and/or 2 sensors, as shown in Fig. 30 below. Check that the voltage (shown circled) is <0.5v with no paper between. Note that Gate 1 is top tray, Gate 2 is middle tray.

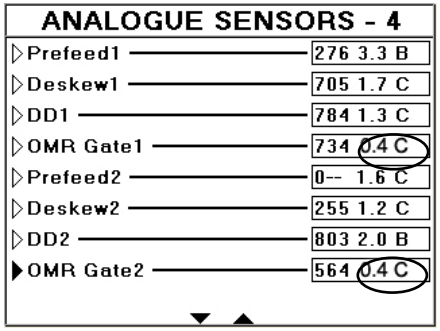


Fig. 30

20. Exit Engineer mode.

21. Now enter Edit mode for the relevant job and select **Edit Item** for stations 1/2 on the tower unit, set Mark Reading to OMR or barcode as required and tick Cascade if a reader is also fitted to the middle tray, as shown in Fig. 31 below.

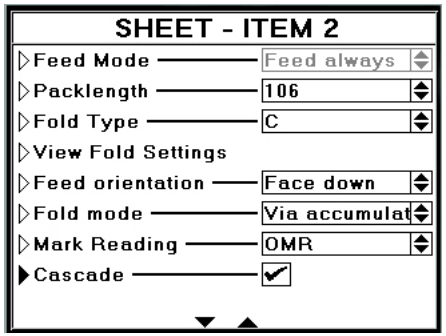


Fig. 31

22. Use cable ties to secure added wires and cables away from any moving parts, snag points or sharp edges.

23. Replace all covers unless station 2 (cascade) OMR is also to be fitted, in which case see section 3.16.2.

24. The OMR/barcode job is now ready to be run. If OMR read problems are encountered, use the OMR scope function in the Trace Tools debugging utility, described in section 3.14 of the service manual.

DS-140 Configuration

25. Enter Engineer mode from the setup screen and select 'Hardware Setup'. Select the 'Edit' tab, then the appropriate hopper of the mark-reading unit(s). Set the number of readers for each hopper as required, as shown in Fig. 31a below.

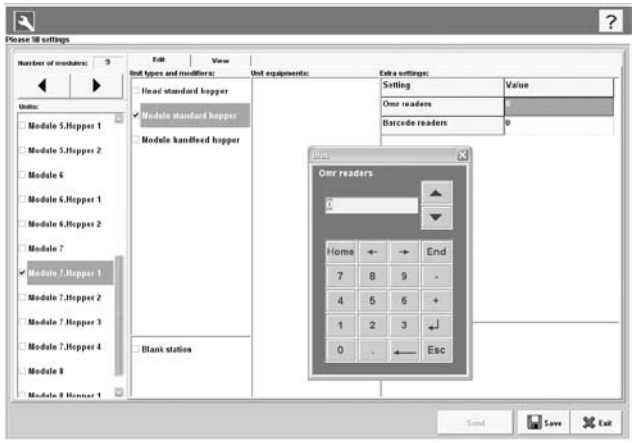


Fig. 31a

26. Select 'Module for the tower unit, then select the type of reader for each relevant channel number, as shown in Fig. 31b. Ch. 1-4 are for OMR reader, Ch. 9 & 10 for barcode **See connection diagram at 3.17.1 fig. 43 for further explanation of channels.**

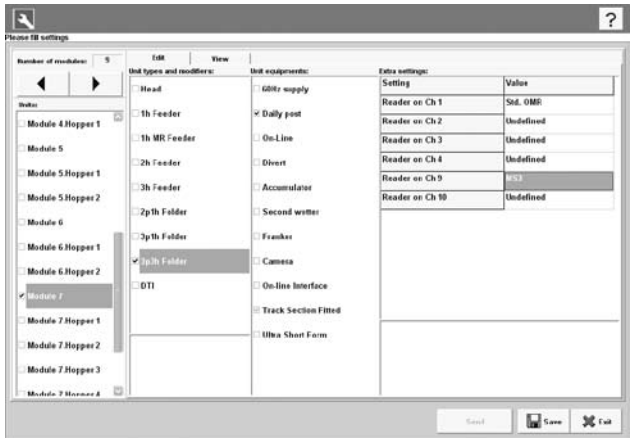


Fig. 31b

27. In Engineer mode, select 'Diagnostics', then 'Analogue Sensors' tab. Calibrate the OMR Gate, as shown in Fig. 31c below. Repeat for any other OMR/barcode hoppers, save and exit Engineer mode.

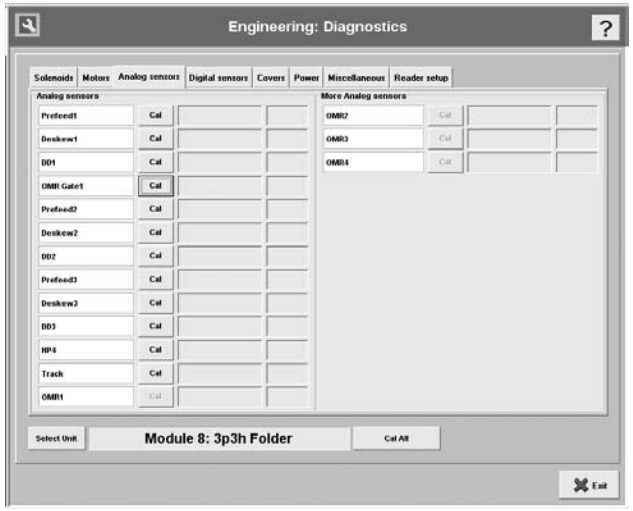


Fig. 31c

cont.

4. Enter 'Configuration' and select the required setup. Select 'Edit', then select the appropriate hopper of the mark-reading unit. Set 'Mark Reading' to 'OMR Marks' or 'Barcode' as required, set 'Fold Mode' to 'Together via accumulator' and set 'Reader (Head) ID' to 1 or 2, depending on which side of the hopper the reader is fitted. Save and exit the configuration. **Note:** the document used in the hopper must have an OMR setup associated with it or 'Mark Reading' will not be enabled. See Fig. 31d below.

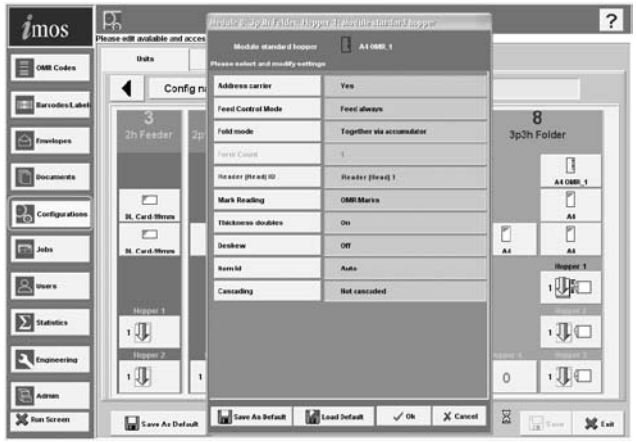


Fig. 31d

The machine is now ready for operation.

Important: Before OMR reading can be used, the licence key must entered and an OMR setup defined – see section 3.19.

See the following page for Cascade OMR

3.16.2 3 Tray Tower Unit with Cascade (Kit A3248A)

The procedure described in section 3.16.1 must first be carried out in full with the exception that the tower access assembly is not refitted until the actions described in this section are carried out.

Fig. 32 below shows the assembly of the parts prior to fitting to the machine. If not already built when received, assemble parts now. Note that RH top read is shown - if bottom read is required, swap over the positions of the OMR head and foot assembly opposite. If LH is required, the OMR head/foot are assembled at the other end of the slider bar. The location along the bar of the OMR head depends upon the required approximate position to align with the marks on the paper. Wherever it is located, the sliders C6223A should be roughly evenly distributed about it.

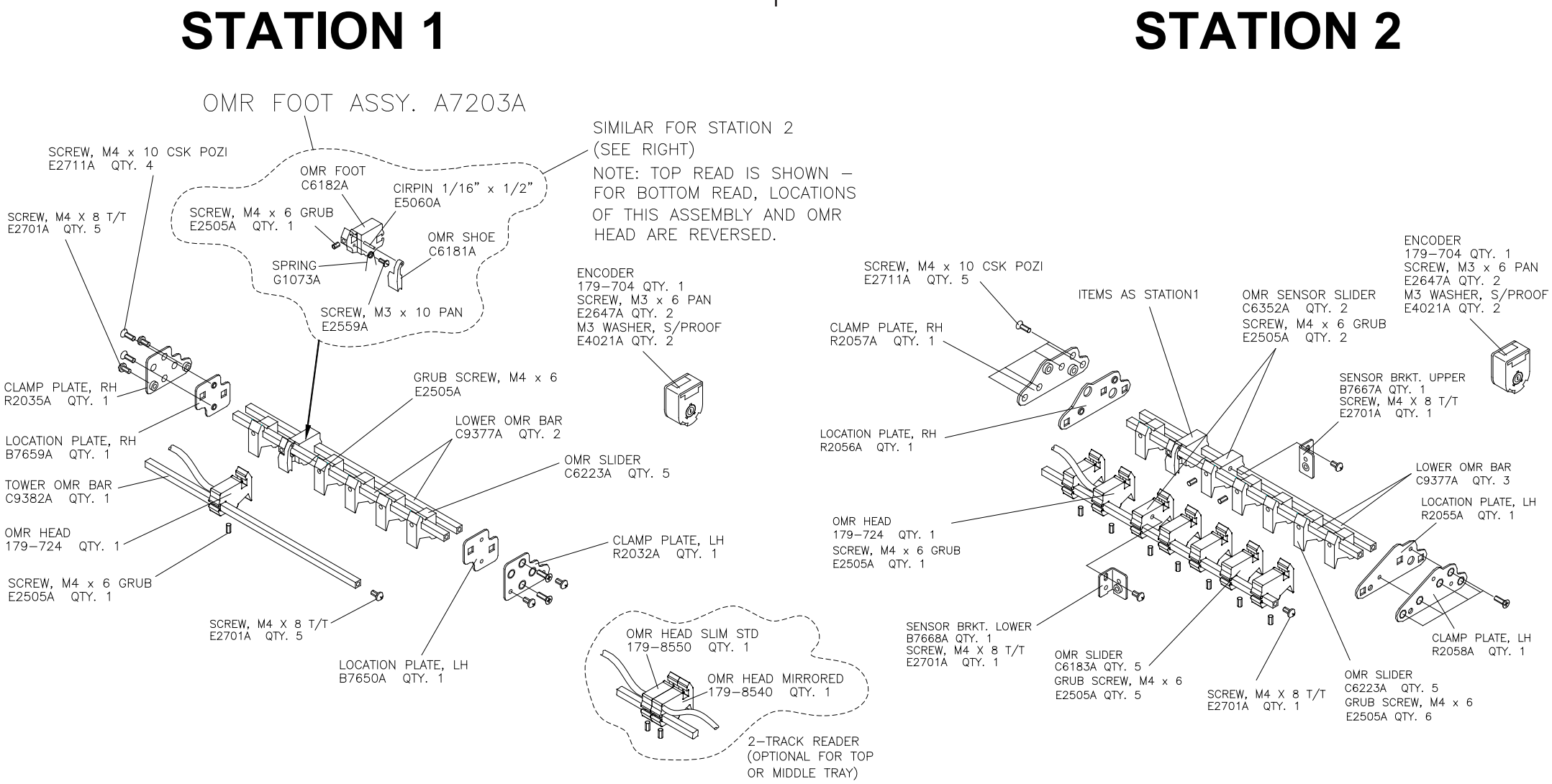

STATION 1
STATION 2
OMR FOOT ASSY. A7203A
SIMILAR FOR STATION 2 (SEE RIGHT)
NOTE: TOP READ IS SHOWN – FOR BOTTOM READ, LOCATIONS OF THIS ASSEMBLY AND OMR HEAD ARE REVERSED.
SCREW, M4 x 10 CSK POZI E2711A QTY. 4
OMR FOOT C6182A
CIRPIN 1/16" x 1/2" E5060A
SCREW, M4 x 6 GRUB E2505A QTY. 1
SCREW, M4 X 8 T/T E2701A QTY. 5
OMR SHOE C6181A
SPRING G1073A
SCREW, M3 x 10 PAN E2559A
ENCODER 179–704 QTY. 1
SCREW, M3 x 6 PAN E2647A QTY. 2
M3 WASHER, S/PROOF E4021A QTY. 2
CLAMP PLATE, RH R2035A QTY. 1
GRUB SCREW, M4 x 6 E2505A
LOWER OMR BAR C9377A QTY. 2
LOCATION PLATE, RH B7659A QTY. 1
OMR SLIDER C6223A QTY. 5
TOWER OMR BAR C9382A QTY. 1
OMR HEAD 179–724 QTY. 1
CLAMP PLATE, LH R2032A QTY. 1
SCREW, M4 x 6 GRUB E2505A QTY. 1
SCREW, M4 X 8 T/T E2701A QTY. 5
LOCATION PLATE, LH B7650A QTY. 1
OMR HEAD SLIM STD 179–8550 QTY. 1
OMR HEAD MIRRORED 179–8540 QTY. 1
2–TRACK READER (OPTIONAL FOR TOP OR MIDDLE TRAY)
SCREW, M4 x 10 CSK POZI E2711A QTY. 5
ITEMS AS STATION1
OMR SENSOR SLIDER C6352A QTY. 2
SCREW, M4 x 6 GRUB E2505A QTY. 2
ENCODER 179–704 QTY. 1
SCREW, M3 x 6 PAN E2647A QTY. 2
M3 WASHER, S/PROOF E4021A QTY. 2
CLAMP PLATE, RH R2057A QTY. 1
SENSOR BRKT. UPPER B7667A QTY. 1
SCREW, M4 X 8 T/T E2701A QTY. 1
LOCATION PLATE, RH R2056A QTY. 1
LOWER OMR BAR C9377A QTY. 3
LOCATION PLATE, LH R2055A QTY. 1
OMR HEAD 179–724 QTY. 1
SCREW, M4 x 6 GRUB E2505A QTY. 1
SENSOR BRKT. LOWER B7668A QTY. 1
SCREW, M4 X 8 T/T E2701A QTY. 1
OMR SLIDER C6183A QTY. 5
GRUB SCREW, M4 x 6 E2505A QTY. 5
SCREW, M4 X 8 T/T E2701A QTY. 1
OMR SLIDER C6223A QTY. 5
GRUB SCREW, M4 x 6 E2505A QTY. 6
CLAMP PLATE, LH R2058A QTY. 1

Fig. 32

Fitting the OMR assembly to the machine

At this stage, it is assumed that the machine will still have covers and tower access assembly removed, as described in 3.16.1 steps 1 & 2 and that station 1 OMR assembly has been fitted as described. For station 2, proceed as follows:

1. On the RH side, remove the the gears shown in Fig. 33 below. This provides access to the end of the transport roller shaft and extrusion screws.

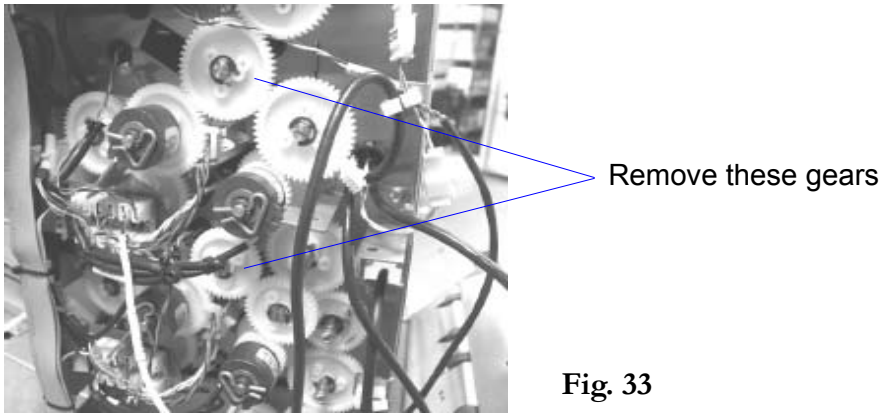


Fig. 33

2. Remove the 'E' clips, 'T' bearings and springs from both ends of the transport roller shaft and lift it out of the chassis. In its place, fit the OMR transport roller shaft A2844A, supplied in the kit. Assemble this with the nylon encoder mount P2150A in place of the 'T' bearing on the LH end. Note that the stepped end of the shaft runs through this mount.

3. Assemble the encoder base plate to the nylon mount using 2 off M3 x 6 screws & lockwashers (see Fig. 32). On the encoder cover, align the small grub screw hole with the slot on the curved part of the cover and insert the Allen key (this is normally supplied with the Allen key in place). Clip the cover onto the base and tighten the grub screw onto the end of the transport shaft. Pull out the Allen key and turn the adjustor slot fully clockwise to position 2. **Note:** when the encoder cover has been clipped in place, it cannot then be removed.

4. Connect the supplied encoder cable 182-703 from the encoder to the upper Splitter PCB on the LH side. Wires are connected BLK/WHT to J1, RED/BRN to J2.

5. Remove the infill cover and pivot plate shown in Fig. 34 below. Also remove the paper transport bridge just below the infill cover, and the extrusion under it.

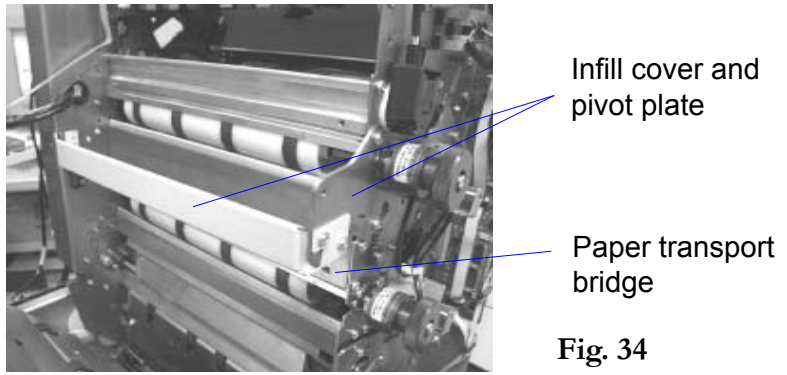


Fig. 34

6. Fit the new extrusion C7401A but do not fully tighten the screws. Insert 3 sheets of 80gsm (20lbs bond) paper between the extrusion and the white roller below it. Bias the extrusion so that the paper just fits in the gap and tighten the screws. Check that there is slight drag on the paper as it is pulled out of the gap.

7. Fit the new OMR transport bridge B7670A in place of the paper transport bridge.

8. On the OMR assembly, ensure that the gate sensors are in place and correctly connected (RED/BLK wires inside the tower unit). Fit the unit into the tower, feeding the sensor and OMR head wires through the plastic bush on the RH side. On the LH side, ensure the pip on the assembly side plate locates into the notch in the chassis edge.

9. Refit the infill cover and pivot plate.

10. Refit the tower access assembly as described in section 3.16.1 step 13.

Connection

11. Using the supplied 182-352 extension lead, connect the sensor wires to the middle (station 2) splitter PCB on the RH side - YEL/BLU to J7, RED/BLK to J8.
12. Connect the OMR head as described in section 3.16.1 step 16. If one head is fitted at station 2, connect to channel 3. If two heads, connect to channels 3 & 4.
13. Use cable ties to secure added wires and cables away from any moving parts, snag points or sharp edges.
14. Follow the Engineer and job setup instructions described section 3.16.1 step 18.
15. Replace all covers. The OMR job is now ready to be run. If OMR read problems are encountered, use the OMR scope function in the Trace Tools debugging utility, described in section 3.14.

Important: Before OMR reading can be used, the licence key must entered and an OMR setup defined – see section 3.19.

3.16.3 Single Tray Tower Unit (Kit A3266A)

The procedure for single tray machines is exactly the same as section 3.16.1 (for 3-tray machines with OMR on one tray only), except for the OMR Access bridge, shown in Fig. 26. This is replaced by B7614A and is supplied in the kit.

Note that the pictures shown in section 3.16.1 will differ slightly from the single station machine, but all actions will be the same.

3.17 FITTING A BARCODE HEAD

Machines not fitted with a Barcode reader can be upgraded to full barcode specification by ordering the appropriate kit of parts:

A3292A	Vertical Barcode Upgrade Kit (3-tray machines)
A3293A	Horizontal Barcode Upgrade Kit (3-tray machines)
A3296A	Vertical Barcode Upgrade Kit (1-tray machines)
A3297A	Horizontal Barcode Upgrade Kit (1-tray machines)

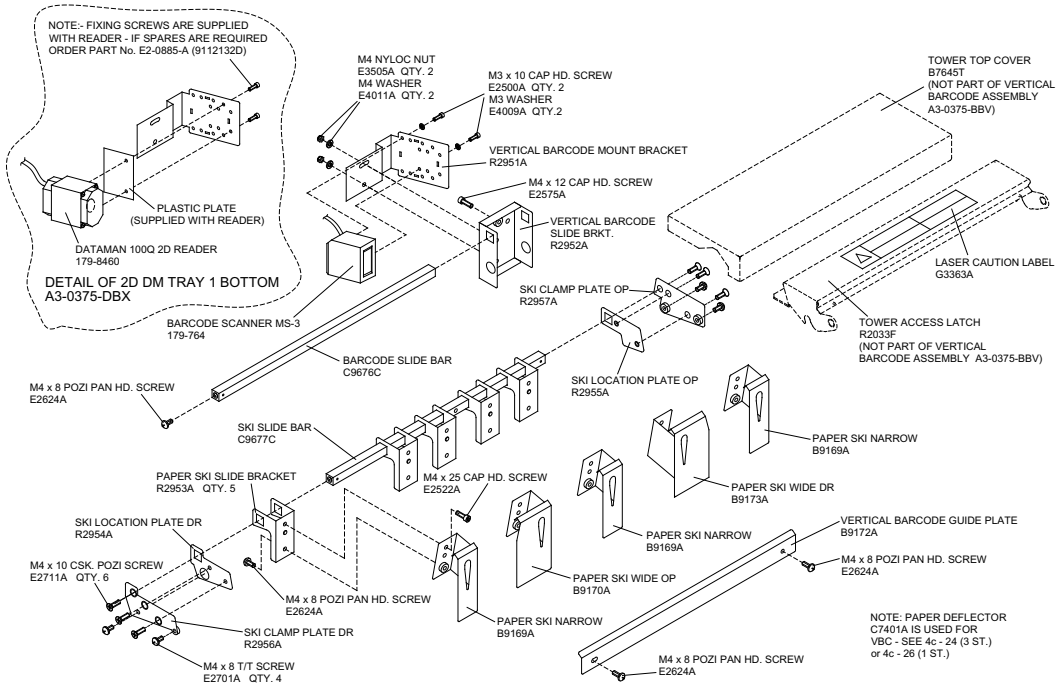

NOTE:- FIXING SCREWS ARE SUPPLIED WITH READER - IF SPARES ARE REQUIRED ORDER PART No. E2-0885-A (9112132D)
PLASTIC PLATE (SUPPLIED WITH READER)
DATAMAN 100Q 2D READER 179-8460
DETAIL OF 2D DM TRAY 1 BOTTOM A3-0375-DBX
M4 NYLOC NUT E3505A QTY. 2
M4 WASHER E4011A QTY. 2
M3 x 10 CAP HD. SCREW E2500A QTY. 2
M3 WASHER E4009A QTY.2
VERTICAL BARCODE MOUNT BRACKET R2951A
M4 x 12 CAP HD. SCREW E2575A
VERTICAL BARCODE SLIDE BRKT. R2952A
TOWER TOP COVER B7645T (NOT PART OF VERTICAL BARCODE ASSEMBLY A3-0375-BBV)
LASER CAUTION LABEL G3363A
SKI CLAMP PLATE OP R2957A
TOWER ACCESS LATCH R2033F (NOT PART OF VERTICAL BARCODE ASSEMBLY A3-0375-BBV)
BARCODE SCANNER MS-3 179-764
BARCODE SLIDE BAR C9676C
SKI LOCATION PLATE OP R2955A
M4 x 8 POZI PAN HD. SCREW E2624A
SKI SLIDE BAR C9677C
PAPER SKI NARROW B9169A
PAPER SKI WIDE DR B9173A
PAPER SKI SLIDE BRACKET R2953A QTY. 5
M4 x 25 CAP HD. SCREW E2522A
SKI LOCATION PLATE DR R2954A
PAPER SKI NARROW B9169A
VERTICAL BARCODE GUIDE PLATE B9172A
M4 x 10 CSK. POZI SCREW E2711A QTY. 6
M4 x 8 POZI PAN HD. SCREW E2624A
PAPER SKI WIDE OP B9170A
M4 x 8 POZI PAN HD. SCREW E2624A
SKI CLAMP PLATE DR R2956A
PAPER SKI NARROW B9169A
NOTE: PAPER DEFLECTOR C7401A IS USED FOR VBC - SEE 4c - 24 (3 ST.) or 4c - 26 (1 ST.)
M4 x 8 T/T SCREW E2701A QTY. 4
M4 x 8 POZI PAN HD. SCREW E2624A

Fig. 35: Vertical Barcode Upgrade Kit A3292A or A3296A

Both vertical and horizontal use the same barcode scanner (179-764). For a 3-tray 3-plate folder, the assemblies can only be fitted to the upper tray. The single tray kit differs by including an Expansion PCB and ribbon cable needed for connection; these are fitted as standard on 3-tray machines.

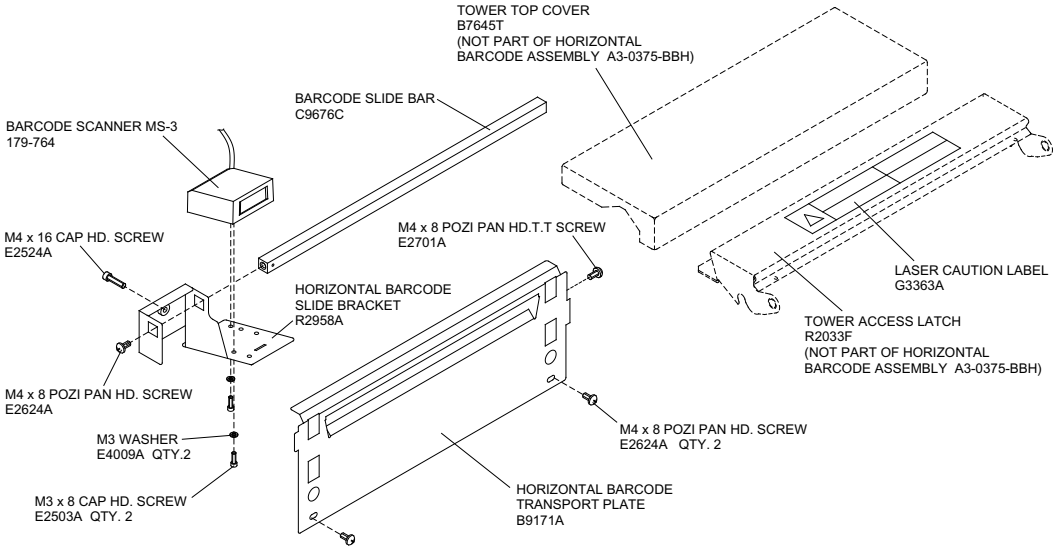

TOWER TOP COVER B7645T (NOT PART OF HORIZONTAL BARCODE ASSEMBLY A3-0375-BBH)
BARCODE SLIDE BAR C9676C
BARCODE SCANNER MS-3 179-764
M4 x 16 CAP HD. SCREW E2524A
M4 x 8 POZI PAN HD.T.T SCREW E2701A
HORIZONTAL BARCODE SLIDE BRACKET R2958A
LASER CAUTION LABEL G3363A
TOWER ACCESS LATCH R2033F (NOT PART OF HORIZONTAL BARCODE ASSEMBLY A3-0375-BBH)
M4 x 8 POZI PAN HD. SCREW E2624A
M3 WASHER E4009A QTY.2
M4 x 8 POZI PAN HD. SCREW E2624A QTY. 2
M3 x 8 CAP HD. SCREW E2503A QTY. 2
HORIZONTAL BARCODE TRANSPORT PLATE B9171A

Fig. 36: Horizontal Barcode Upgrade Kit A3293A or A3297A

3.17.1 Fitting a vertical barcode assembly to the machine

1. Remove the RH side cover and open the LH side cover.
2. Remove the tower access assy - this is not essential, but is quick to do, and greatly improves access (the tower access assy is the pivoting section at the top front of the tower). The pivot bar is retained with a screw at each end, and a nylon strap.
3. Remove the paper tranport plate (opposite the tower access assembly) - this is retained by 2 screws on the lower edge, 1 screw on the LH side. Note that the plate will be different depending on whether the machine is a 3-tray or a single tray; both are retained similarly. Also remove the extrusion (see Fig. 37) that the paper transport plate attaches to (2 screws at each end) and fit the replacement item. Note that to access the screws on the LH side, the gear idler must be removed, as shown in Fig 38 opposite).
4. Assemble the paper skis, location plates, clamp plates and ski slide bar as shown in Fig. 35 on the previous page, but do not tighten the M4 x 25 screws at this stage. Slide the assembly into the cavity of the machine, as shown in Fig. 37 below. Retain the LH end using 2 screws, as shown. Fit the guide plate so that the angled flange is under the tips of the skis.

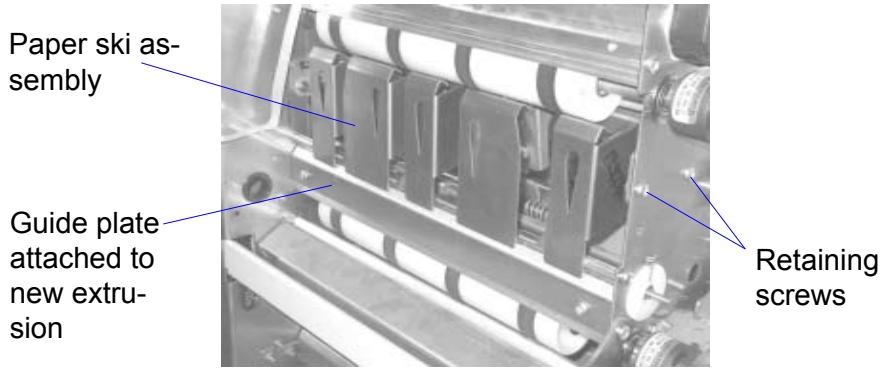


Fig. 37

5. At the RH end, remove the idler gear shown in Fig. 38 below. This will provide access to the 2 screw holes for fitting the retaining screws. Refit the idler gear.

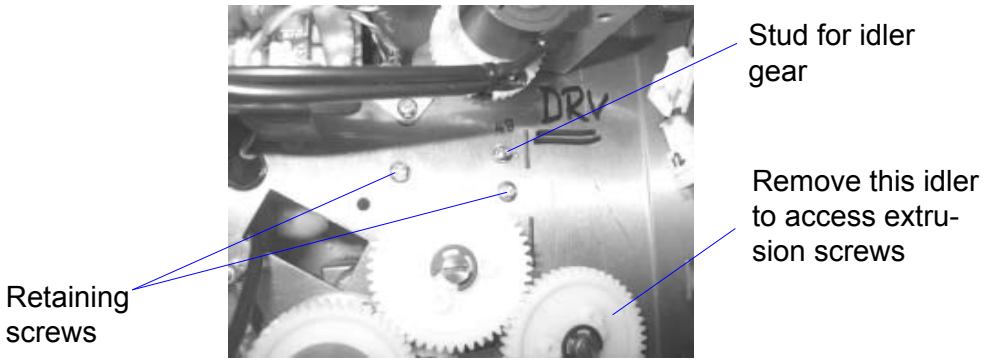


Fig. 38

6. Refit the tower access assembly (remember to fit the nylon strap).
7. At the rear of the machine, remove the upper hopper. Assemble the scanner to the bracket as shown in Fig. 39 below. Note that there are different hole positions depending upon requirement. Generally the scanner should be as far away from the paper as possible, moving it to a more forward position if the barcode is very dense, or other read problems occur.

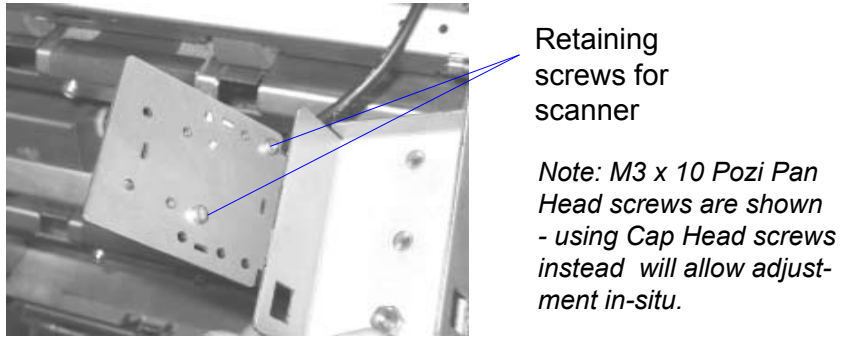

Retaining screws for scanner
Note: M3 x 10 Pozi Pan Head screws are shown - using Cap Head screws instead will allow adjustment in-situ.

Fig. 39

8. Slide the bracket assembly with scanner onto the barcode slide bar and assemble this into the rear of the machine (see Fig. 40 below). The bar is retained with 1 screw at the RH end - to access the hole, remove the bracket for the upper splitter PCB and move this clear of the hole (do not disconnect cables). See Fig. 41 below. Replace the bracket when the screw is tightened.

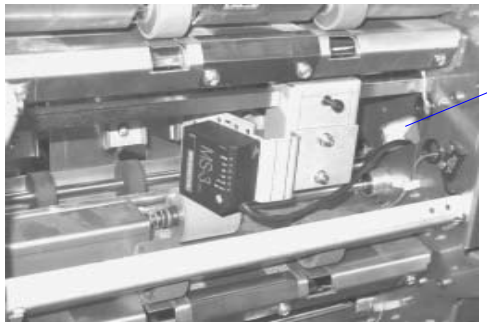


Fig. 40

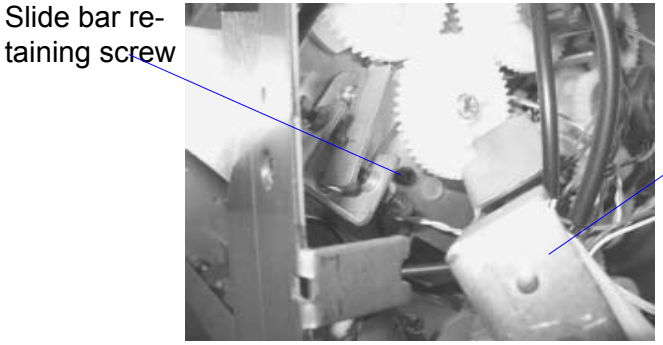


Fig. 41

9. Fit the laser warning label to the inside of the tower access assembly after degreasing the surface (see Figs. 35 & 36).

Connection

10. Route the scanner cable through the chassis cutout shown in Fig. 40 and retain it using existing chassis clips, as shown in Fig. 42 opposite. Connect the extender cable to the scanner cable and attach this to existing ribbons using cable ties. Connect the cable to J7 on the expansion PCB - **see step 11 for single tray machines.**

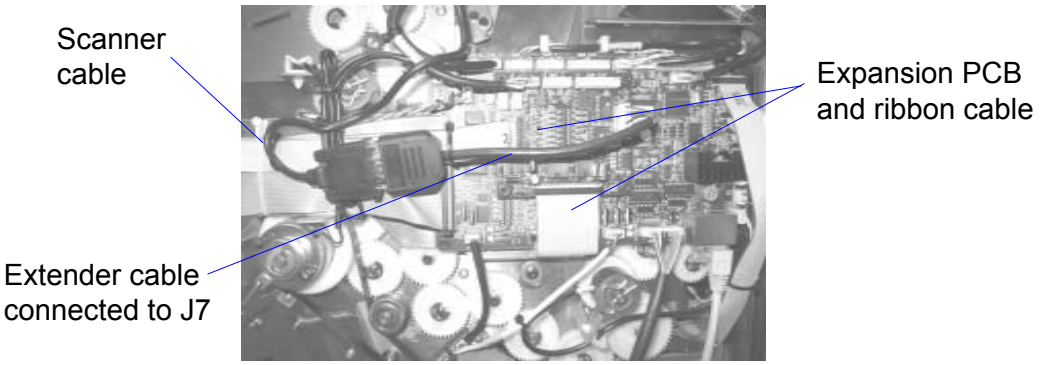


Fig. 42

Single tray machines only

11. Single tray machines are not fitted with an Expansion PCB as standard, hence the upgrade kit includes this item, together with 4 spacers with screws for mounting it, and a ribbon cable for connection. To fit the Expansion PCB, remove the screw in each corner of the main PCB and lift it away from the chassis sufficiently to insert and tighten the M4 x 6 Cap Head screws for the spacers. Refit the main PCB and assemble the Expansion PCB to the spacers using M4 x 6 Cap Head screws. Connect the ribbon cable between main and Expansion PCBs as shown in Fig. 42.

cont.

See also connection diagram on the following page.

Barcode Reader Connection

There are two barcode reader types available, Microscan MS-3 and Cognex DM-100; the DM-100 is primarily used as a 2D Datamatrix reader, but can also be used for barcode reading. The diagram below shows the connectivity of the readers with their part numbers. Connections are also shown for the standard or 2-track OMR reader and the SICK KT3 OMR reader, as this may be used in conjuction with a barcode reader and would affect its connection. Note that the SICK reader can only be used on the mark-reading feeder, not the 2-plate folder. 2-track OMR readers can be fitted to the top or middle tray of the tower unit.

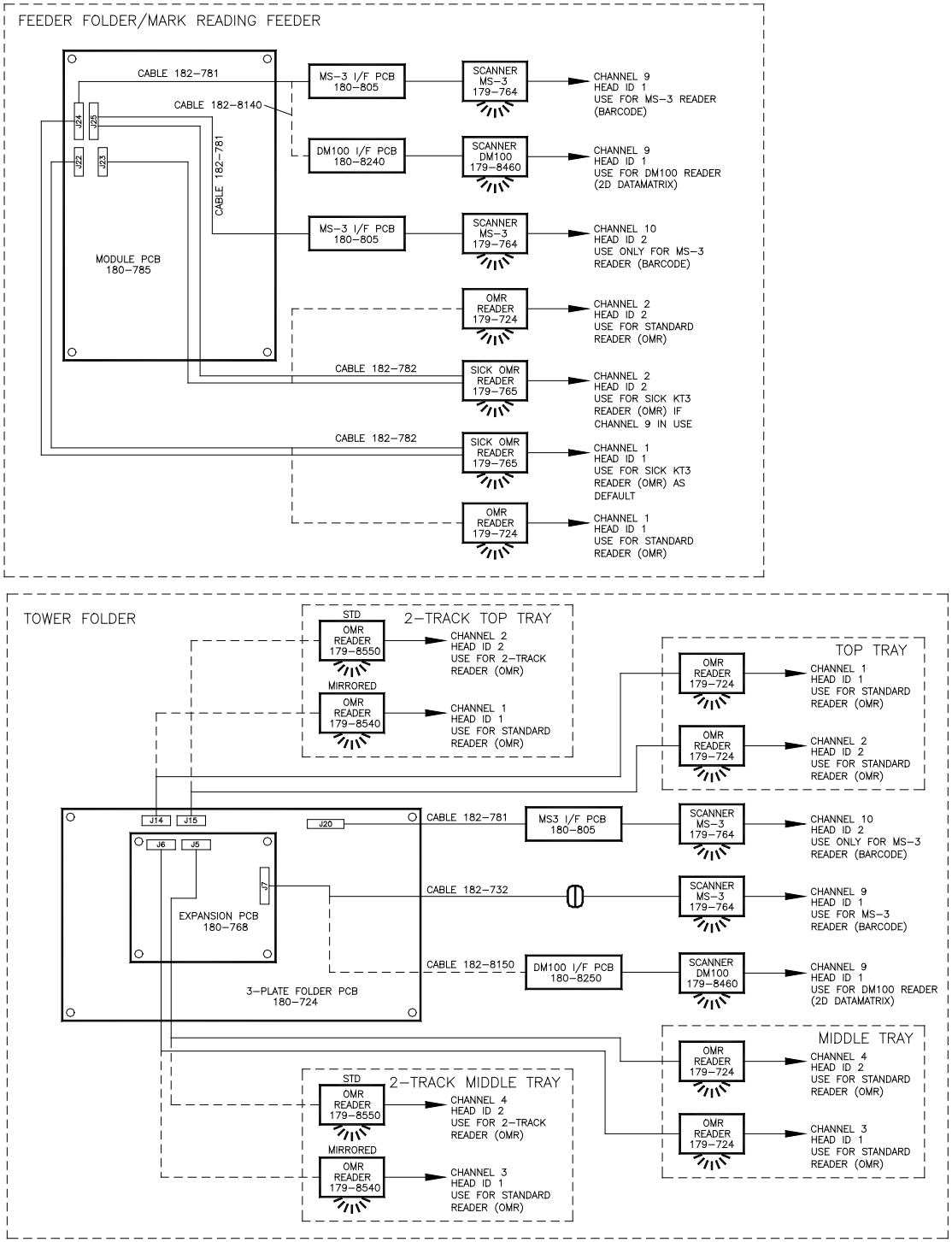

FEEDER FOLDER/MARK READING FEEDER
CABLE 182-781
CABLE 182-8140
CABLE 182-781
MODULE PCB 180-785
MS-3 I/F PCB 180-805
SCANNER MS-3 179-764
CHANNEL 9 HEAD ID 1 USE FOR MS-3 READER (BARCODE)
DM100 I/F PCB 180-8240
SCANNER DM100 179-8460
CHANNEL 9 HEAD ID 1 USE FOR DM100 READER (2D DATAMATRIX)
MS-3 I/F PCB 180-805
SCANNER MS-3 179-764
CHANNEL 10 HEAD ID 2 USE ONLY FOR MS-3 READER (BARCODE)
OMR READER 179-724
CHANNEL 2 HEAD ID 2 USE FOR STANDARD READER (OMR)
CABLE 182-782
SICK OMR READER 179-765
CHANNEL 2 HEAD ID 2 USE FOR SICK KT3 READER (OMR) IF CHANNEL 9 IN USE
CABLE 182-782
SICK OMR READER 179-765
CHANNEL 1 HEAD ID 1 USE FOR SICK KT3 READER (OMR) AS DEFAULT
OMR READER 179-724
CHANNEL 1 HEAD ID 1 USE FOR STANDARD READER (OMR)
TOWER FOLDER
STD
2-TRACK TOP TRAY
OMR READER 179-8550
CHANNEL 2 HEAD ID 2 USE FOR 2-TRACK READER (OMR)
MIRRORED
OMR READER 179-8540
CHANNEL 1 HEAD ID 1 USE FOR STANDARD READER (OMR)
TOP TRAY
OMR READER 179-724
CHANNEL 1 HEAD ID 1 USE FOR STANDARD READER (OMR)
OMR READER 179-724
CHANNEL 2 HEAD ID 2 USE FOR STANDARD READER (OMR)
EXPANSION PCB 180-768
3-PLATE FOLDER PCB 180-724
CABLE 182-781
MS3 I/F PCB 180-805
SCANNER MS-3 179-764
CHANNEL 10 HEAD ID 2 USE ONLY FOR MS-3 READER (BARCODE)
CABLE 182-732
SCANNER MS-3 179-764
CHANNEL 9 HEAD ID 1 USE FOR MS-3 READER (BARCODE)
CABLE 182-8150
DM100 I/F PCB 180-8250
SCANNER DM100 179-8460
CHANNEL 9 HEAD ID 1 USE FOR DM100 READER (2D DATAMATRIX)
MIDDLE TRAY
OMR READER 179-724
CHANNEL 4 HEAD ID 2 USE FOR STANDARD READER (OMR)
OMR READER 179-724
CHANNEL 3 HEAD ID 1 USE FOR STANDARD READER (OMR)
STD
2-TRACK MIDDLE TRAY
OMR READER 179-8550
CHANNEL 4 HEAD ID 2 USE FOR 2-TRACK READER (OMR)
MIRRORED
OMR READER 179-8540
CHANNEL 3 HEAD ID 1 USE FOR STANDARD READER (OMR)

Fig. 43

Machine configuration

12. After fitting the barcode scanner, the machine must be configured to recognise it.

    The procedure for both 100 & 140 is described in 3.16.1 step 18.

Important: Before barcode reading can be used, the licence key must entered and a barcode setup defined – see section 3.19.

Scanner alignment

13. The scanner beam must now be aligned with the centre line of the barcode. Switch on the machine and providing the upper hopper tray is removed, the beam can be seen from the rear (the hopper interlock detects when the hopper is removed and switches on the scanner). Wind a piece of OMR printed paper into the rollers so that the barcode passes the beam. Slide the scanner bracket until the beam is centrally aligned on the barcode and tighten the screw. The angle of the bracket can also be adjusted to allow the beam to run in line with the barcode.

14. Remove the paper, and from the front of the machine, slide the paper skis so that they are approximately equally spaced over the length of the slider bar, then tighten the screws. Ensure that the beam is not obstructed by any of the skis.

    See also section 3.18 for further alignment and calibration details.

3.17.2 Fitting a horizontal barcode assembly to the machine

1. Remove the RH side cover and open the LH side cover.
2. Remove the tower access assy - this is not essential, but is quick to do, and greatly improves access (the tower access assy is the pivoting section at the top front of the tower). The pivot bar is retained with a screw at each end, and a nylon strap.
3. Remove the paper tranport plate (opposite the tower access assembly) - this is retained by 2 screws on the lower edge, 1 screw on the LH side. Note that the plate will be different depending on whether the machine is a 3-tray or a single tray; both are retained similarly. Fit the new item in its place, as shown in Fig. 45 below:

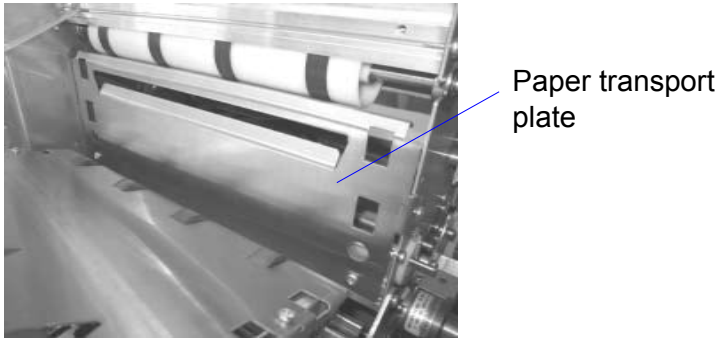
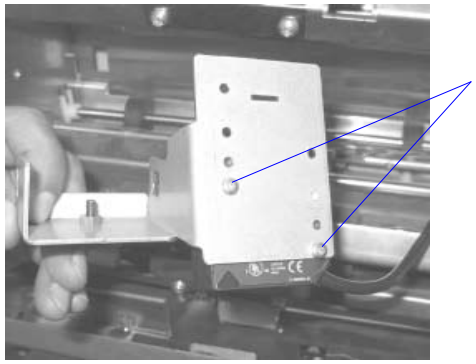


Fig. 45

4. At the rear of the machine, remove the upper hopper. Assemble the scanner to the bracket as shown in Fig. 46 opposite. Note that there are different hole positions depending upon requirement. Generally the scanner should be as far away from the paper as possible, moving it to a more forward position if the barcode is very dense, or other read problems occur.
5. Fit the M4 x 12 Cap Head screw to the scanner bracket, but do not tighten at this stage. Slide the bracket onto the bar, and fit it into the rear of the machine, as shown in Fig. 47 opposite. **Note:** The bar is retained with 1 screw at the RH end - to access the hole, remove the bracket for the upper splitter PCB and move this clear of the hole (do not disconnect cables) - see 3.17.1 step 8. Replace the bracket when the screw is tightened.



Note: M3 x 10 Pozi Pan Head screws are shown - using Cap Head screws instead will allow adjustment in-situ.

Fig. 46

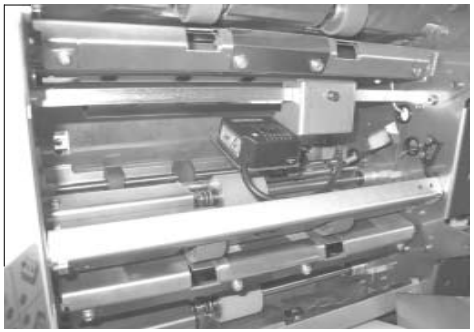


Fig. 47

6. Refit the tower access assembly (remember to fit the nylon strap).
7. Fit the laser warning label to the inside of the tower access assembly after degreasing the surface (see Figs. 35 & 36).

cont.

Connection

8. The procedure for connecting the scanner is identical to the procedure for vertical barcode. This is described in 3.17.1 steps 10 & 11.

Important: Before barcode reading can be used, the licence key must entered and a barcode setup defined – see section 3.19.

Configuration

9. The procedure for configuring the machine is identical to the procedure for vertical barcode. This is described in 3.17.1 step 12.

10. The scanner beam must now be aligned with the barcode. Switch on the machine and providing the upper hopper tray is removed, the beam can be seen from the rear (the hopper interlock detects when the hopper is removed and switches on the scanner). Wind a piece of OMR printed paper into the rollers so that the barcode passes the beam. Slide the scanner bracket until the beam is centrally aligned on the barcode and tighten the screw.

    See also section 3.18 opposite. for alignment and calibration details.

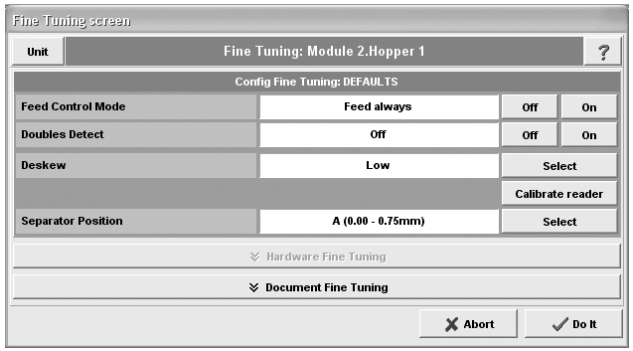
3.18 OMR/BARCODE ALIGNMENT & CALIBRATION

3.18.1 OMR head alignment (100 Series)

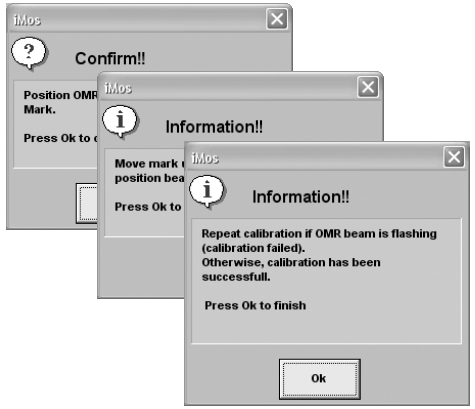
This is described in detail under section 3.16.1 step 15. **Note:** there is no calibration procedure required for 100 Series.

3.18.2 OMR head calibration (140 Series mark reading feeder fitted with SICK read head only)

After alignment of the OMR head, it must be calibrated. To carry this out on a 140 Series with an OMR feeder fitted with a SICK read head, enter the Run Screen. Select the hopper of the appropriate feeder on the graphic to display:



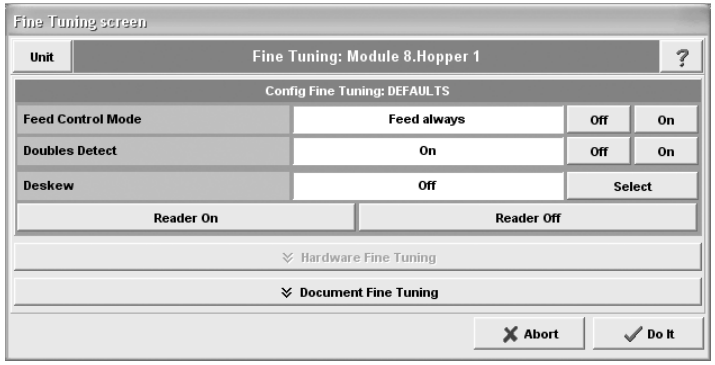
Press 'Calibrate reader' and follow the on-screen instructions:



If no errors are displayed, the head is now calibrated and need only be calibrated again if read errors occur, or the unit fails to read at all. A working reader will flicker on and off as the marks are slowly fed past the head.

3.18.3 Barcode reader calibration (140 Series)

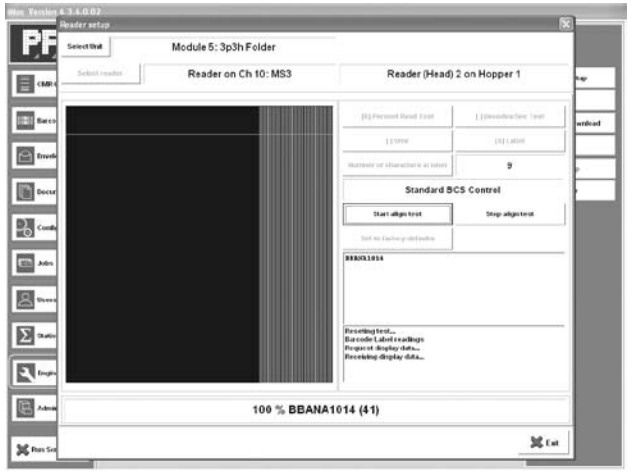
Calibration of the barcode reader requires nothing more than confimation that it is working. Switch on the power and start the operating software, then wind a piece of barcode marked paper under the reader. From the Run screen select the hopper of the appropriate feeder to and press 'Reader On':



When the marked paper is under the reader and being successfully read, the reader will beep in confirmation. Although the reading angle is quite large, the marks should be centrally placed under the reader, difficult to see with bottom read. This is best achieved by moving the reader over to one side, out of range of the marks, then back until the unit beeps. Continue until it stops, then move back approximately half that distance.

3.18.4 Barcode reader diagnosis (140 Series)

The calibration described above relates to the barcode for the specific job. To carry out diagnosis for any barcode, go to the Engineering screen and select 'Reader setup'. Press 'Start align test' to turn on the reader and feed the paper in by hand so that the barcode is under the reader, as shown opposite.

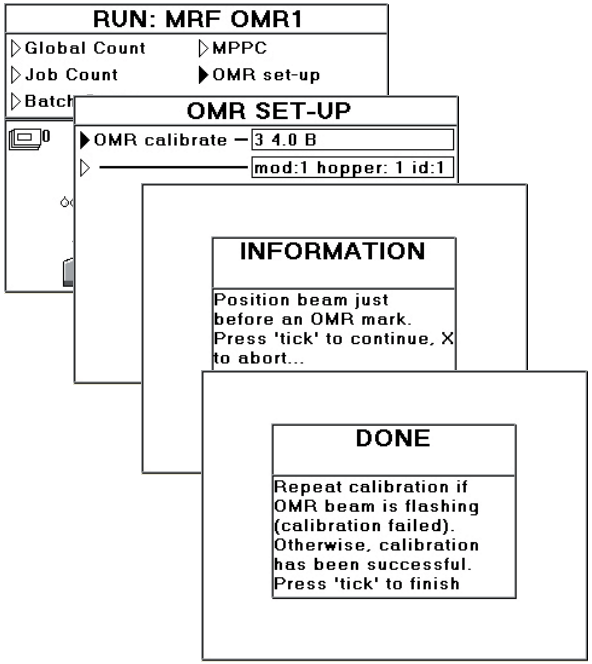


The vertical green lines should extend from the bottom of the display to the top, representing 100% read quality. Less than 100% will result in shorter lines: a poorly reading scanner will produce a histogram effect.

For further assistance in diagnosing barcode reading problems, contact Technical Support department.

3.18.5 OMR reader calibration (100 Series mark-reading feeder with SICK read head only) - see 3.18.6 for standard read head.

Calibration of the OMR reader is carried out from the Run screen with the machine paused. Press the X button to reach the options, then select 'OMR Setup' as shown below. Follow the on-screen instructions. Note that the OMR setup option will only appear if a job that uses an OMR marked document has been selected, and the unit is a mark reading feeder. Calibration should be carried out whenever the mark contrast is different from the last job, or if read errors occur.


RUN: MRF OMR1
Global Count
MPPC
Job Count
OMR set-up
OMR SET-UP
OMR calibrate
3 4.0 B
mod:1 hopper: 1 id:1
INFORMATION
Position beam just before an OMR mark. Press 'tick' to continue, X to abort...
DONE
Repeat calibration if OMR beam is flashing (calibration failed). Otherwise, calibration has been successful. Press 'tick' to finish

If the calibration consistently fails, the mark contrast is too weak.

3.18.6 OMR reader calibration (Standard read head)

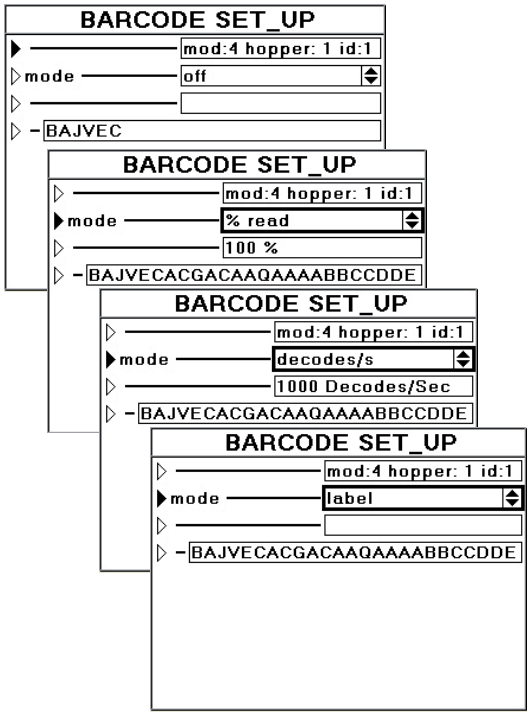
This is carried out from 'Analogue Sensors' in Engineer mode. Select this from the Module Settings for the module that has the head fitted.

Select the required OMR head (OMR1, 2...etc) and press ✓. You will then be prompted to plaece a piece of white paper under the head on press ✓ again. After successful calibration, a confimation will be displayed.

The OMR head need only be calibrated if it is changed, or if the control board is changed, or if read problems are occurring.

3.18.7 Barcode reader calibration (100 Series)

Calibration of the barcode reader is carried out from the Run screen with the machine paused. Press the X button to reach the options, then select 'Barcode Setup' as shown below. Follow the on-screen instructions. Note that the Barcode setup option will only appear if a job that uses a barcode marked document has been selected. Results displayed as below are a read-only report of reader head efficiency.



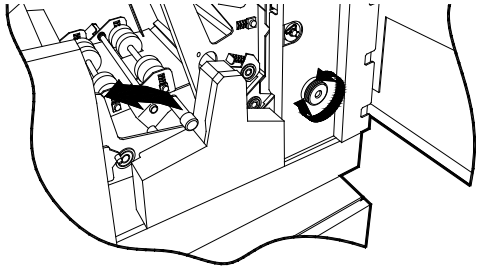
If any further problems persist with setup or calibration, contact Technical Support.

3.18.8 Using Trace Tool (100 series only)

The Trace Tool uitility is primarily used for downloading firmware and also provides useful information about the machine function, and of the degree of read quality. It can be used for both OMR or barcode, though the OMR Scope function (for viewing or capturing a trace) is applicable only to OMR reading.

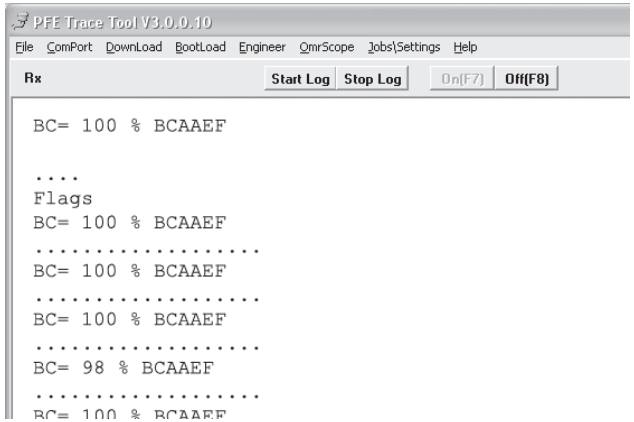
Connect the computer as described in 3.14.1 of the service manual and set up the reader as described above. As the paper is wound into line with the reader, this should repeatedly beep if the marks or barcode are being read.

To determine how well the marks or barcode are read, the information area of the screen in Trace Tools will show a percentage good read. A reading will be shown only when the eject sensor of the 3-plate folder is blocked, most easily performed by lifting the green knob in front of the daily post tray to raise the roller platten, as shown below:



A log of the display can be captured for later analysis by Technical Support. Select 'Start Log' and select a directory. This will start the capture of the data and stop when 'Stop Log' is selected, creating a logfile in the directory.

An example screen display is opposite, for a barcode. In this case, this shows the percentage read quality of a barcode reader, and the decoded data. The read should be as near 100% as possible, and while a figure below this may well work quite acceptably, steps should be taken to try to increase the read quality. Moving the scanner to a position closer to the paper may well increase the percentage, otherwise the print quality of the barcode should be looked at (see opposite).



To capture an OMR trace, select 'OmrScope', then 'Save as bitmap' to save to a chosen filename and directory. This can be used for analysis by Technical Support department.

Test run the machine with representative paper. If read errors are occurring, or if the barcode quality is poor (eg. bad or too dense printing), move the scanner further forward on its bracket - see step 4. The scanner should be as far back as possible without read errors. **Note:** to preserve scanner life, the beam is actuated only when scanning a barcode-printed page, thus it is actually switching on and off rapidly as documents are processed. It is also switched on when the upper hopper is removed, to allow alignment.

For further assistance in diagnosing OMR or barcode reading problems, contact Technical Support department.

3.19 OMR AND BARCODE LICENCE & DEFINITION FOR 100/140 SERIES

Important: this section must be read in conjunction with the OMR or Barcode Specifications document for 100/140 Series.

For the 100 series to be enabled for OMR or barcode, an Advanced or Flex licence must be obtained. This will then allow the label to be programmed to create a definition.

The 140 series does not require a licence; full programming is available as standard within IMOS.

This procedure assumes that the licence key has already been obtained. This key must then be entered into the software before an OMR or barcode definition can be created: the definition can then be selected by the operator for use within a job.

Full details of entering the 100 licence key, and then programming 100 and 140 for OMR or barcode, Advanced or Flex are detailed in Appendix 1, 'Licencing and Programming 100/140 Series'.

3.20 TOWER FEEDER

The tower feeder is a 2-hopper version of the single feeder. It adopts a similar, but not identical, version of the feed mechanism as used by the 3-plate folder. Paper specifications for the hoppers are as the standard feeder, with the exception that the maximum thickness limit for the upper hopper is 2mm, due to the paper path being too tight for thicker items. The lower half of the unit, including the conveyors, is identical to the standard feeder. There is no OMR option for the tower feeder.

3.20.1 Separator adjustment

The separator is the same as the standard feeder except that the upper hopper has only three settings, as opposed to four for the lower hopper. The ranges for each are shown below:

Upper Hopper	Lower Hopper
Position A: 0 to 0.75mm	Position A: 0 to 0.75mm
Position B: 0.75 to 1.5mm	Position B: 0.75 to 1.5mm
Position C: 1.5 to 2.0mm	Position C: 1.5 to 2.5mm
	Position D: 2.5 to 4mm

The procedure for adjusting the separators on both hoppers is the same as the standard feeder, as described in section 3.2.

3.20.2 Removal of transport roller assembly

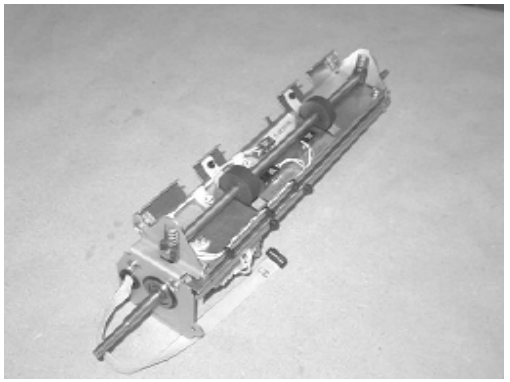


Fig. 50 Transport roller assembly

The transport roller assembly is located roughly in the middle of the machine, visible after removing the sprung pickup shaft from the lower hopper. A number of sensors are located on the assembly, and can only be accessed by removing it. The removal procedure is described below:

1. Remove the clutch pins, clutches and drive pins on the two 104T pulleys (see Fig. 51 below). Also remove the screw on the clutch bracket and move it clear, within the confines of the cables.

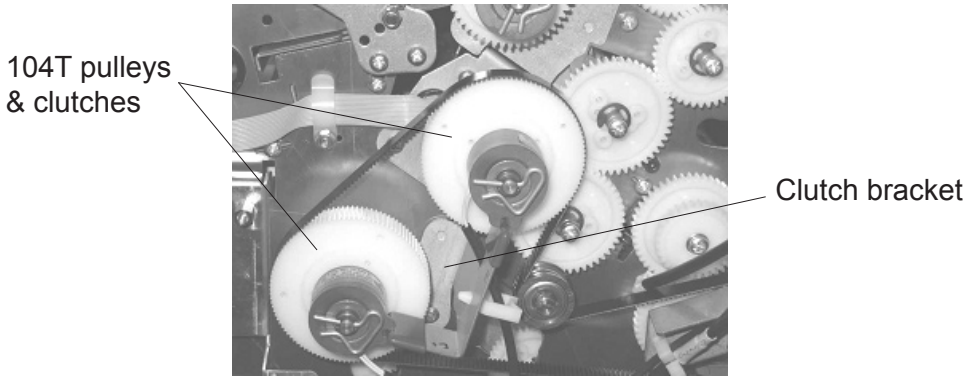


Fig. 51

2. Slacken the drive belt tensioner and remove the belt. Slide the 104T pulleys off the shaft.
3. Remove two idlers and the 40T gear, as shown in Fig. 52 below. Also remove the safety plate.

Fig. 52

4. Disconnect the ribbon cable from the main PCB (J27) and release the ribbon from the chassis clips.
5. Remove the 2 screws each side securing the lower feed tray and withdraw the tray as far as possible - ensure the reflective sensor cable is not being strained. Take care if another unit is located behind, as space will be limited.
6. Remove the sprung feed shaft assembly from the lower hopper.
7. On the operator side, remove the green paper eject knob, drive pin and clutch, as shown in Fig. 53 opposite.

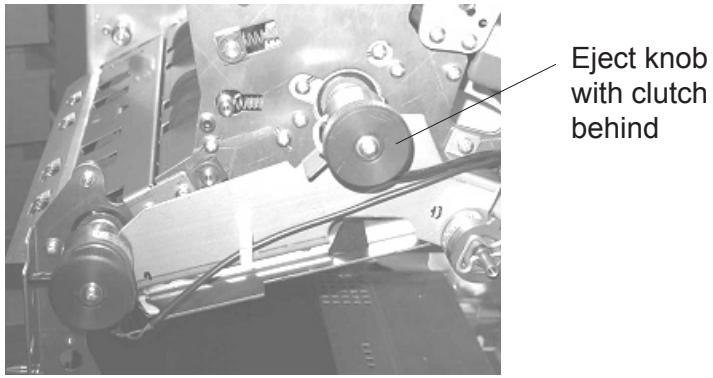


Fig. 53

8. Remove the grey infill cover below the upper hopper, retained with 1 screw each side on the chassis, 1 each side on the top surface of the tray (later covers are in 2 parts, with 3 screws each side). **Important:** the infill cover can only be removed after removal of the lower feed tray (as described in step 5).
9. Remove the 2 screws each side securing the transport roller assembly and lift it out of the chassis from the drive side (see Fig. 54 below).

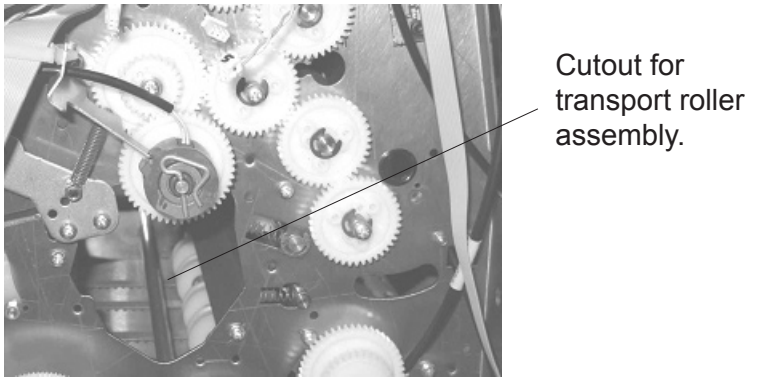


Fig. 54

10. To replace the transport roller assembly, refit all parts in reverse order to removal. **Note:** when refitting the grey infill cover below the upper hopper, it is possible to replace it incorrectly. Take care to ensure it is assembled as described in Fig. 55 below (later covers are in 2 parts, but the instruction applies equally).

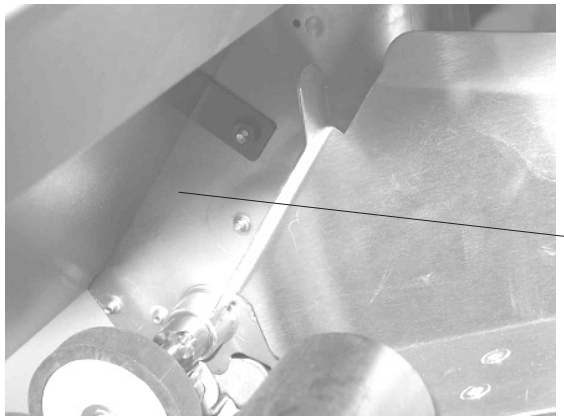


Fig. 55

3.20.3 Cleaning of lower transport rollers

Due to accessibility, these rollers cannot easily be reached during routine cleaning, and hence should be cleaned at every site visit. The rollers are part of the transport roller assembly, and are located below the upper rollers visible in Fig. 50. There are two ways to clean the rollers:

1. On the lower hopper, remove the spring-loaded pickup shaft (the side guides must be fully open to do this). Dampen a clean cloth with Roller Cleaning Fluid, then using the green knob on the operator side, turn the rollers whilst feeding the cloth into the nip of the rollers while holding the cloth back so that it can just be felt to drag. This will ensure that both upper and lower rollers are cleaned (see Fig. 56 opposite).

2. Remove the lower infill cover below the tray (2 screws each side, with 1 on the the top surface. Clean the upper rollers from above, as seen on Fig. 56. Clean the lower rollers by reaching in below the hopper with a piece of fluid-dampened cloth - the lower rollers can easily be felt. Use the green knob to rotate.

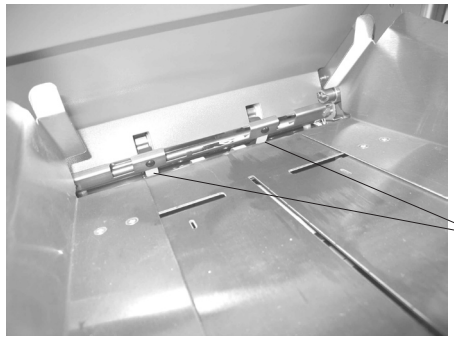


Fig. 56

3.20.4 Clearing paper crashes

If a paper crash occurs, this is most likely to be at the eject sensor at the exit. To clear the jam, it can be awkward to pull the paper out if raising the roller carrier at the exit. An easier method is described below:

1. Lower the operator side cover of the tower feeder and the feed unit in front (if the unit in front is the insert head, raise the perspex cover).

2. Use the green knob on the feed unit in front to swing down the lower conveyor, or raise the rearmost clam assembly if the unit in front is the insert head.

3. Turn the green knobs on the tower feeder to wind the crashed document into the cavity ahead.

3.21 2-PLATE FOLDER

The 2-plate folder is a simplied version of the 3-plate folder, but is only available with one hopper: this is the same assembly as used on the top assembly of the 3-plate. The unit is available as either an end unit, or in-line (mounted on the track), the difference being a blanking cover fitted to the rear of the end unit. An optional handfeed slot may be specified, located in front of the paper hopper. The unit may be fitted with either OMR or bar-code, top or bottom reading.

3.21.1 Separator Adjustment/Replacement

The procedures for adjustment or replacement are identical to that for the 3-plate folder, described in section 3.3.1.

3.21.2 Fold Roller Replacement

The five fold rollers are contained within a removable assembly, which is then stripped down for roller replacement. To remove. proceed as follows:

1. Remove the RH side cover and open the LH side cover. Also remove the upper and lower front covers. The upper cover is secured with 2 screws in each chassis side plate, the lower is withdrawn from the LH side after removing 2 screws in the LH chassis side plate.
2. Pull out the paper hopper and fold plate assembly; the assembly pivots upwards before sliding out.
3. Referring to Fig. 57 below: on the RH side, remove the bracing plate, take off the drive belt and lift out the gear cluster supported in the plate. Also remove the idle gear shown by unscrewing the post.
4. From behind, remove the pivoting latch plate assembly by loosening the pivot spigots (10mm AF). Also remove the transport plate (2 x screws in each chassis side plate). See Fig. 58 below.

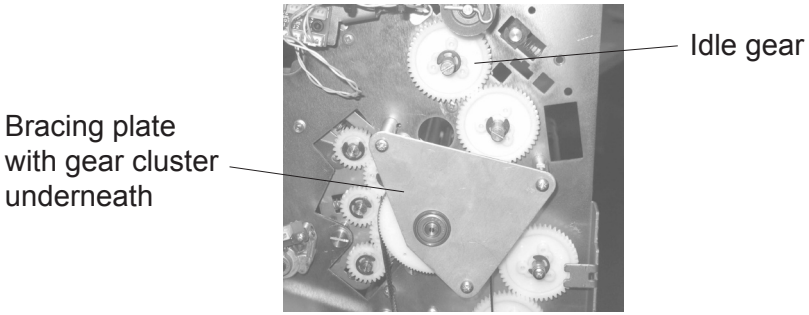


Fig. 57

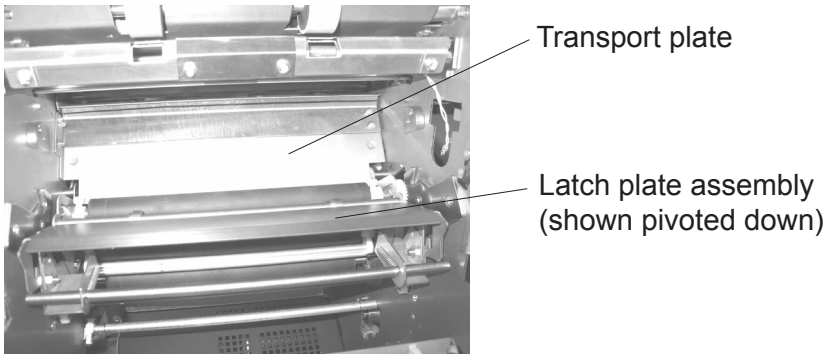


Fig. 58

5. Referring to Fig. 59 below: from the front, remove the LH pivot plate for the output plate assembly. Move the plate forward clear of the area, but do not disconnect the sensor wire. Also remove the upper portion of the transport plate underneath the output plate (2 screws in each chassis side plate). Note that to access the screws on the LH side, the green knob, brake and gear must be removed. Also take out the screws for the brake locating bracket, but do not remove it.

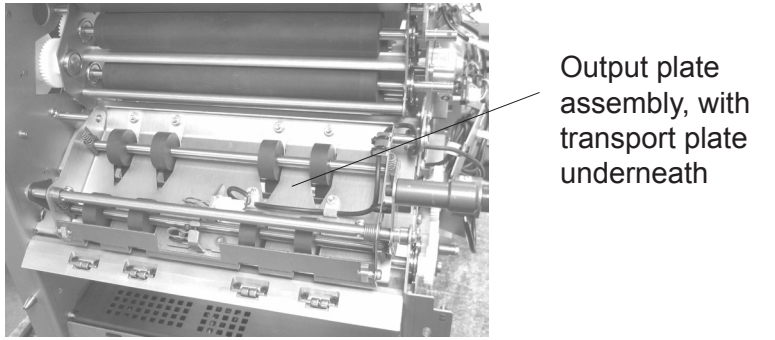


Fig. 59

6. Remove the 3 slot-headed screws each side securing the folder assembly, and lift out the assembly from the front. Fig. 60 below shows the removed assembly.

Fig. 60

7. When disassembling the folder, carefully note the orientation of the return springs for the no-fold beams to ensure they are replaced correctly.
8. Replacement of all parts is a reversal of removal. Fig. 61 below shows the correct belt route.

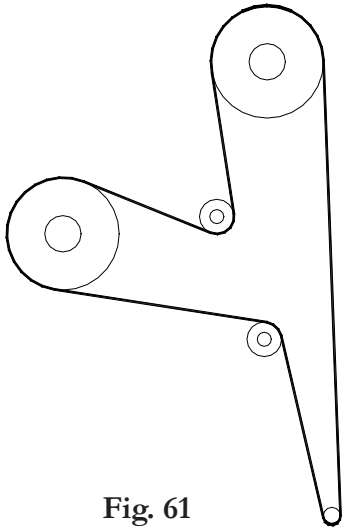


Fig. 61

3.22 OMR FEEDER

3.22.1 Separator & Feed Tray

The separator fitted to the OMR feeder is identical to that fitted to the standard feeder, and is adjusted in the same way, as described in section 3.2.1. Note that the feed tray fitted is the same as that fitted to the Tower feeder and is approx. 75mm shorter than the tray fitted to the standard feeder. This longer tray can be fitted as an alternative if required, but only if the unit behind is a standard feeder, OMR feeder or Datacard Turnover Unit. The part number for the tray assembly is A7031A.

3.22.2 Changing top or bottom OMR/Barcode

The read head for top read OMR or barcode is mounted on a sliding bracket on a square section slider bar at the front of the machine. The bar passes through the chassis on the drive side and is retained on the operator side by a single screw through the chassis side plate.

The read head for bottom read OMR or barcode is mounted on a lead screw in a sub-chassis assembly which lifts out of the unit on the drive side. Note that top read machines still have the side plate for the sub-chassis fitted on the drive side, bt no other parts.

If it is required to change from top to bottom read OMR or barcode, or vice-versa, parts must be ordered as shown on section 4b-39. Note that the same OMR or barcode reader is used for top or bottom read.

3.22.3 OMR/Barcode alignment & Calibration

This is described in section 3.18.

3.22.4 Transport Roller Assembly Removal

The transport roller assembly is mounted at the front of the unit, just below the infeed shaft. It includes a feed roller shaft and also the hold-point, deskew and DD sensors. Removal is required for replacement of feed rollers, and for access to the splitter PCB behind, and at the same time the transport shaft behind can be removed if required. As the rollers of the two shafts are in contact, if one set needs replacement, the other will as well. The assembly is the same for OMR and barcode except for an encoder and a longer feed shaft fitted on the OMR assembly only.

To remove:

1. Remove both side covers, front cover and infill cover (section 3.1.2).
2. Lift out the pickup shaft.
3. On the drive side, remove the clutch and gear (loosen clutch locator to remove gear), 2 idler gears and 3 screws. Also remove the flanged bearing/ wavy washer under the clutch and gear (see Fig. 72a below).

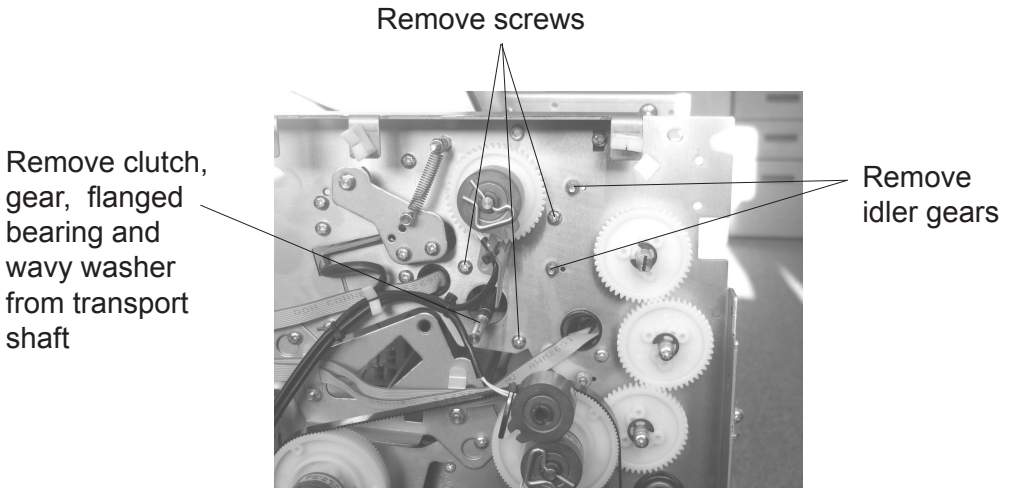


Fig. 72a (drive side)

4. On the operator side, remove the green knob and brake, and the flanged bearing/wavy washer. Alo remove the 3 screws and disconnect the encoder cable on OMR models (see Fig. 72b below).

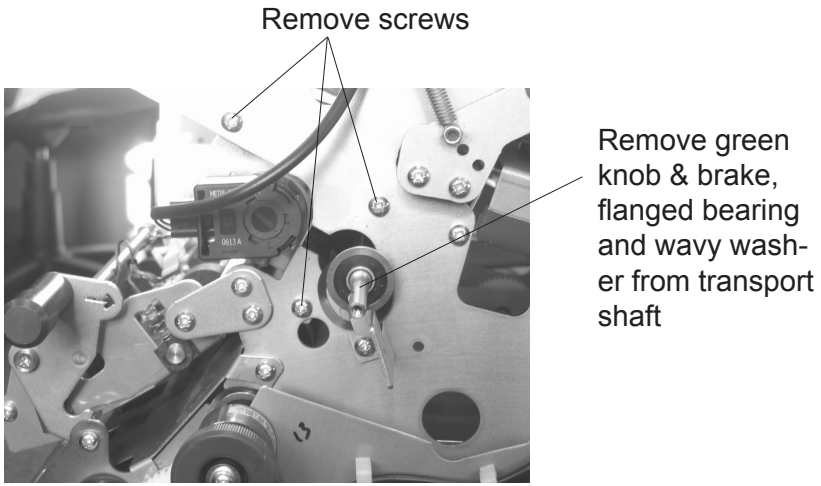
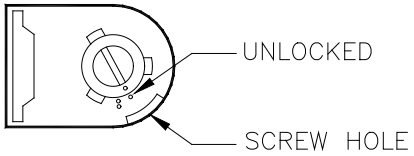


Fig. 72b (operator side)

5. Disconnect the ribbon cable from the splitter PCB at the front and lift the assembly out of the machine, disconnecting the ribbon cable from the splitter PCB behind the unit as it is withdrawn. Lift the transport shaft out also. See sections 4b-37 & 4b-38 for disassembly.

6. Encoder Removal (OMR only) - this is required to replace the shaft. The encoder is held to the shaft by an small Allen screw, visible by turning the recessed knob to the 1-dot position. Slowly turn the shaft until the screw becomes visible in the aperture, then slacken it using a 0.9mm Allen key (supplied with a new encoder or available from PFE). Slide the shaft out of the encoder. After replacing, turn the knob to the 2-dot position.



7. Reassembly of the tranport assembly is a reversal of removal. Remember to reconnect the ribbon cables.

3.23 RECOMMENDED SPARES

The following spares are recommended to be held by Service Agents. There is a separate list for each module, both 230v and 115v. To order each list of spares, quote the part numbers shown. Quantities shown are per machine.

Insert Head 100/140 Series - order A0341A (230v) or A0344A (115v)

NTL Pt No.	SAP Pt No.	Description	Qty
169-115	9100459U	Rivet 5mm 2.5-3.5 Grip	2
169-145	9100469E	Rivet 3.5mm 2-3 grip	4
179-213	9100518F	Clutch EC30 CW 8mm 24V	1
179-214	9100519G	Clutch EC30 CCW 8mm 24V	1
180-689	9100709E	PCB Assy Disc Sensor	1
180-720	9100723U	PCB AM4 Processor	1
180-8360	9109914T	PCB C4 Control Mk.2	1
180-746	9100741N	PCB Hi-Res disk sensor	1
180-758	9100743Q	PCB Splitter 5sens 2 sol	1
180-759	9100744R	PCB Splitter 5sens 5 sol	1
180-760	9100745S	PCB Splitter 3sens 4 sol	1
181-0770	9108705J	Motor WD 179-072 4WJST CCW (230v)	1
	or		
181-5770	9108706K	Motor WD 179-073 4WJST CCW (115v)	1
181-070	9100788M	Motor WD 24VDC 217RPM	1
181-104	9100790P	Clutch wired 102-10 CW	1
181-105UL	9100792R	Clutch wired 102-20 CW	1
181-117	9100800Z	Clutch Wired XH 102-10	1
181-119	9100801A	SM Wired Solenoid TDS-10SL-A (SS)	2
181-127	9100806F	Clutch Wired XH 102-20	1
181-128	9100807G	Clutch Wired Lenze 04 179-155 2WXH	1
181-132	9100811L	Clutch Wired Lenze 03 179-154 2WXH	1
181-142	9100816R	XH Wired solenoid TDS-10SL-A (SS)	1
182-337	9100975G	Loom Emitter 100	1
182-339	9100977J	Loom Receiver N/A 100	1
182-342	9100980M	Loom Receiver N/A 200	1
182-343	9100981N	Loom Emitter 300	1
182-345	9100983Q	Loom Receiver N/A 300 SM	1
182-418	9105294F	Reed Switch 3WXH (UL)	1
182-437	9101007Q	Loom Emitter 100 XH	1
182-438	9101008R	Loom Receiver W/A 100 XH	1
182-439	9101009S	Loom Receiver N/A 100 XH	1
182-440	9101010T	Loom Emitter 200 XH	1
182-441	9101011U	Loom Receiver W/A 200 XH	1
182-442	9101012V	Loom Receiver N/A 200 XH	1
182-443	9101013W	Loom Emitter 300 XH	1
182-444	9101014X	Loom Receiver W/A 300 XH	1
182-445	9101015Y	Loom Receiver N/A 300 XH	1
182-557	9101049J	Loom AM4 T101 link (Terminator)	1
182-567	9101050K	Loom AM4 Float switch	1
182-572	9101052M	Loom Wired Reed switch 3W SM	1
182-693	9101087Y	OPB715 Wired Sensor	1
183-7690	9108707L	Loom 350mm El Hsg Plg 4W - El Hsg Plg 4W	1
184-2350	9110540V	AM4 Universal Head PSU	1
C8098A	9108237W	Roller Envelope Feed	6
C8166A	9103532V	Sealer Roller Top	2
C8167A	9103533W	Sealer Roller (40 dia)	1
C8168A	9103534X	Sealer Roller (25 dia)	1
D0021A	9103602T	Transport Roller 30x8	8
D0022A	9103603U	Transport Roller 25x8	4
D0044A	9103613E	Transport Roller 40x15	8
D0051A	9103618K	Separator Pad 45-55	4
D0052A	9103619L	Envelope Jog Tyre	2
D1040A	9103641J	8mm 'T' Bearing	4
E0204A	9103744R	Vinyl Cap 3.5Id x12.7	4
E0227A	9103755C	M3 Stud Vinyl Cap	2
E0367A	9103789N	Washer Waved 23mm ID	2
E1070A	9103829E	Bearing 6 x 8 x 13.8	2
E1078A	9103835L	Flanged Bearing 8 x 22 x 7	10
E5071A	9104133W	3dia x 14lg Dowel Pin	5
E5074A	9104135Y	3dia x 8lg Dowel Pin	5
E5078A	9104138B	2.5dia x 14lg 058 Grooved Pin	2
F5112A	9104493W	Belt 100-S2M-280	1
F5119A	9104497A	Belt Set 140xl 037 Polyurethane set (4)	1
F5120A	9104499C	Belt Set 130xl 037 Polyurethane set (4)	1
G0135A	9104598F	Wetter Foam Edge	2
G0136A	9104599G	Wetter Foam Centre	1
G1111A	9104681S	Spring Light Pressure (Green)	2
G1116A	9104685W	Spring Intermediate Pressure (Yellow)	2
G1117A	9104686X	Spring Heavy Pressure (Red)	2
G1136A	9104695G	Spring OMR Shaft (Blue)	2
G1152A	9104699L	Spring Solenoid	1
G1180A	9104713A	Spring Link	1
G1181A	9104714B	Spring Wetter	1
G1182A	9104715C	Spring Conveyor	2

NTL Pt No.	SAP Pt No.	Description	Qty
G1183A	9104716D	SpringTensioner	2
G1206A	9104722K	Spring Overguide	2
G4092A	9104827U	Bridge Clamp	4
G6181A	9104925W	Chain Tape	2
H0000A	9104983G	6mm Polycord	1M

Feeder - order A0342A (230v) or A0345A (115v)

NTL Pt No.	SAP Pt No.	Description	Qty
180-761	9100746T	PCB Splitter 6TX H/D	1
180-762	9100747U	PCB Splitter 6RX H/D	1
180-785	9105209S	PCB AM4 Twr/Feeder	1
181-069	9105274K	Motor Wired 179-072 4WJST CW (230v)	1
		or	
181-569	9100831G	Motor Wired 179-073 4WJST CW (115v)	1
182-333	9100973E	Wired Reed Switch 3W SM	1
184-168	9101137A	AM4 Feeder/Folder PSU Assy.	1
E5105A	9104150P	3dia x 24lg Dowel Pin	4
E5110A	9104151Q	2.5dia x 16lg Dowel Pin	1
F5002A	9104430F	Belt 140xl 037	1
F5113A	9104495Y	Belt 100-S2M-710	1
F5121A	9104501E	Belt Set 300xl 037 Polyurethane set (4)	1
F5122A	9104502F	Belt Set 330xl 037 Polyurethane set (4)	1

(Other requirements are included in the Insert Head list)

Tower Folder - order A0343A (230v) or A0346A (115v)

NTL Pt No.	SAP Pt No.	Description	Qty.
179-704	9100537A	Shaft Encoder	1 (OMR)
179-724	9100547L	Loom AM4 OMR Head Assembly	1 (OMR)
180-692	9100711G	PCB Vane sensor	1
180-724	9100727Y	PCB AM4 3 Plate Folder	1
180-764	9100748V	PCB Led Module	1
180-768	9108260V	PCB AM4 3 Plate Expansion	1
180-769	9108024Z	PCB AM4 Stepper	1 (Acc.)
181-062	9100784H	Motor wired stepper	1 (Acc.)
182-574	9101053N	Loom wired Reed Switch 2X3W XH	1 (Acc.)
182-701	9101088Z	Loom OPB715 wired sensor 4WXH	1
182-702	9101089A	Loom OPB715 wired sensor 4WSM	1 (Acc.)
184-169	9101138B	3P Folder PSU Assembly	1
A7097A	9101747L	Separator Pad	2
A7120A	9101752R	Gearbox Assembly (Cast)	1
C8175A	9103539C	Lower Fold Roller	3
C8176A	9103540D	Upper Fold Roller 'A'	1
C8177A	9103541E	Upper Fold Roller 'B'	1
C8186A	9103542F	Pick-Up Roller Shaft Assy	1
C8187A	9103543G	Separator Roller	1
E1030A	9103807G	Roller Clutch 8 x 12 x 12	1
E1059A	9103824Z	Needle bearing 8 x 12 x 8	2
E1102A	9103841S	Flanged Bearing 8 x 19 x 6	2
E1105A	9103842T	Needle Bearing 3 x 6.5 x 6	2
F5123A	9104503G	Belt 100-S2M-480 Polyurethane	1
F5124A	9104504H	Belt 100-S2M-300 Polyurethane	1 (Acc.)
F5136A	9104506K	Belt 430xl 037 Polyurethane	2 (Acc.)
G0152A	9104603L	Restrictor Cork	4
G1026A	9104626K	Spring Fold Roller	2
G1029C	9110058T	Spring DD	1
G1160A	9104701N	Spring No Fold Return	1
G1203A	9104721J	Spring Fold Roller	2
G1207A	9104723L	Separator Spring Std	1

(Other parts are included in the Insert Head and Feeder lists)

Feeder Folder - order A0434A (230v) or A0435A (115v)

NTL Pt No.	SAP Pt No.	Description	Qty.
180-746	9100741N	PCB ASSY HI-RES SENSOR	1
180-785	9105209S	PCB ASSY AM4 TWR/FEEDER	1
181-069	9105274K	MTR WD 179-072 4WJST CW	1 (230v)
	or		
181-569	9100831G	MTR WD 179-073 4WJST CW	1 (115v)
181-117	9100800Z	CLUTCH W/D XH 102-10 CW	1
181-127	9100806F	CLUTCH W/D XH 102-20 CCW	1
182-337	9100975G	LOOM EMITTER 100	1
182-344	9100982P	LOOM RECEIVER W/A 300	1
182-345	9100983Q	LOOM RECEIVER N/A 300	1
182-441	9101011U	LOOM RECEIVER W/A 200 XH	1
182-443	9101013W	LOOM EMITTER 300 XH	1
182-444	9101014X	LOOM RECEIVER W/A 300 XH	1
182-450	9105292D	LOOM 4W-4W XH LINK 0.25M	1
184-168	9101137A	AM4 FDR/FOLDER PSU ASSY	1
A7097A	9101747L	SEPARATOR ASSY	2
A7120A	9101752R	GEARBOX ASSEMBLY (CAST)	1
A7179A	9101756V	SEPARATOR ROLLER ASSY	1
C8142A	9103515C	FOLD ROLLER 30 DIA	2
C8143A	9103516D	FOLD ROLLER 25 DIA	3
C8186A	9103542F	PICKUP ROLLER SHAFT ASSY	1
D1040A	9103641J	BEARING HSG 'T' 8mm MIN	6
F5151A	9105217A	BELT 100-S2M-900	1
G0152A	9104603L	INFEED RESTRICTOR CORK	2

Tower Feeder - order A0438A (230v) or A0439A (115v)

NTL Pt No.	SAP Pt No.	Description	Qty.
179-755	9100561A	PSU LAMBDA ZWS50-24	1
180-746	9100741N	PCB ASSY HI-RES SENSOR	1
180-759	9100744R	PCB SPLIT 5SEN 5SOL H/D	1
180-760	9100745S	PCB SPLIT 3SEN 4SOL H/D	1
180-761	9100746T	PCB SPLITTER 6TX H/D	1
180-762	9100747U	PCB SPLITTER 6RX H/D	1
180-785	9105209S	PCB ASSY AM4 TWR/FEEDER	1
181-069	9105274K	MTR WD 179-072 4WJST CW	1 (230v)
	or		
181-569	9100831G	MTR WD 179-073 4WJST CW	1 (115v)
181-117	9100800Z	CLUTCH W/D XH 102-10 CW	1
181-127	9100806F	CLUTCH W/D XH 102-20 CCW	1
182-338	9100976H	LOOM RECEIVER W/A 100	1
182-437	9101007Q	LOOM EMITTER 100 XH	1
182-440	9101010T	LOOM EMITTER 200 XH	1
182-443	9101013W	LOOM EMITTER 300 XH	1
182-444	9101014X	LOOM RECEIVER W/A 300 XH	1
182-445	9101015Y	LOOM RECEIVER N/A 300 XH	1
182-723	9107073J	LOOM AM4 TWR FDR RIBBONS	1
C8098A	9103501N	ROLLER ENVELOPE FEED	6
D0051A	9103618K	SEPARATOR PAD 45-55	4
F5113A	9104495Y	BELT 100-S2M-710	1
F5151A	9105217A	BELT 100-S2M-900	1
G0079A	9104579L	CLUTCH PIN	

Datacard DTI - order A0436A (230v) or A0437A (115v)

NTL Pt No.	SAP Pt No.	Description	Qty.
117-240	9100130B	OPTO PAIR LONG RANGE	1
179-213	9100518F	CLUTCH EC30 CW 8mm 24V	1
179-214	9100519G	CLUTCH EC30 CCW 8mm 24V	1
180-776	9100753A	PCB WIDEBODY DISK SENSOR	1
180-783	9107050K	PCB RS232 INTERFACE	1
180-785	9108256R	PCB ASSY AM4 TWR/FEEDER	1
180-794	9105271G	PCB ASSY PHOTOLOGIC DISK	1
181-069	9105274K	MTR WD 179-072 4WJST CW	1
181-132	9100811L	CLUTCH W/D 179-154 2WXH (LENZE)	1
182-337	9100975G	LOOM EMITTER 100	1
182-339	9100977J	LOOM RECEIVER N/A 100	1
182-416	9105267C	LOOM 4W-4W XH LINK 0.3M	1
182-443	9101013W	LOOM EMITTER 300 XH	1
182-450	9105292D	LOOM 4W-4W XH LINK 0.25M	1
182-664	9105284V	LOOM PIE-310 TX 300 (XH)	1
182-665	9105283U	LOOM PIE-310D RX 300(XH)	1
182-728	9105282T	LOOM DTI MC LINKS	1
184-168	9101137A	AM4 FDR/FOLDER PSU ASSY	1
A7331A	9107313J	BRAKE LENZE O3 (Loctite assy reqd.)	1
E5121A	9105816Z	PIN SPLIT 2.5Dx20LG SS (Cotter ISO1234)	1
F4283A	9106926F	GEAR CLUTCH 48T 1M x8mm	1
F5145A	9105593S	BELT 100-S2M-322	1
G0079A	9104579L	CLUTCH PIN	1
G0167P	9105600Z	USE G0167A	1
G5072A	9105614P	BELT SET 666mmx15mm x2/S	1

3.24 PARTS REPLACEMENT BY USAGE

3.24.1 Replacement at 2 million inserts

The following parts are recommended to be changed at 2 million inserts.
See also 3.24.2 – these parts are in addition to the list below.

NOTE: Part Nos. shown in brackets thus () are SAP numbers.

Module	Description	Part No.	Qty	Notes	Qty
Insert Head	Feed roller shaft assy	A2993A (9105468M)	1		
Insert Head	Insert roller shaft Assy	A2994A (9105467L)	1		
Insert Head	Envelope Clutch Shaft Assy	A2997A (9105466K)	1		
Insert Head	Clutch/Brake Shaft Assy	A2998A (9105465J)	1		
Insert Head	Opener assembly	A7022A (9101739C)	1		
Insert Head	Opener assy curled flap (option)	A7413A (9107060V)	1		
Insert Head	Notched Rollers	D0045A (9105523U)	2		
Insert Head	T bearing	D1040A (9103641J)	1		
Insert Head	All long life clutches				
Feeder	Upper transport roller shaft assembly	A2793A. (9107753S)	1		
Feeder	Upper Transport Roller Shaft Assy	A2792A (9106799Y)	1		
Feeder	Transport roller shaft assembly	A2791A (9106765N)	1		
Feeder	Eject Shaft roller Assy	A2790A (9106855G)	1		
Feeder	Gear 40T x 8mm	F4150A (9104398X)	2		
Feeder	Gear 48T x 8mm	F4151A (9104399Y)	2		
Feeder	Gear 25T x 8mm	F4152A (9104400Z)	2		
Feeder	Belt 100-S2M	F5113A (9106993A)	1		
Mark Reading feeder	Eject Shaft roller Assy	A2790A. (9106855G)	1		
Mark Reading feeder	Upper Transport Roller Shaft Assy	A2792A. (9106799Y)	1		
Mark Reading feeder	Upper transport roller shaft assembly	A2793A. (9107753S)	1		
Mark Reading feeder	Lower Transport shaft assy	A7340A (9119828V)	1		
Mark Reading feeder	Middle Transport shaft assembly	A7347A. (9119833A)	1		
Mark Reading feeder	Motor Pulley (220v)	F1372A (9105627C)	1		
Mark Reading feeder	Motor Pulley (110v)	F1373A (9104297S)	1		
Mark Reading feeder	Belt 100-S2M	F5151A (9105217A)	1		
Mark Reading feeder	Gear 40T x 8mm	F4150A (9104398X)	7		
Mark Reading feeder	Gear 48T x 8mm	F4151A (9104399Y)	8		
Mark Reading feeder	Gear 25T x 8mm	F4152A (9104400Z)	2		
Tower Feeder	Upper transport roller shaft assy	A2792A (9106799Y)	1		
Tower Feeder	Tower Access shaft assy	A2845A (9105463G)	3		
Tower Feeder	Transport shaft upper assy	A7232A (9109119Q)	1		
Tower Feeder	Transport shaft lower assy	A7233A (9106628V)	1		

Module	Description	Part No.	Qty	Notes	Qty
Tower Feeder	Eject shaft Assy	A7234A (9106726X)	1		
Tower Feeder	Lower Fdr Roller Assy	A7235A (9106707C)	1		
Tower Feeder	Transport Shaft Assy	A7236A (9106811L)	2		
Tower Feeder	Clutch brake shaft assy	A7237A (9107115C)	1		
Tower Feeder	Belt 100-S2M	F5151A (9105217A)	1		
Tower Feeder	Gear 40T x 8mm	F4150A (9104398X)	12		
Tower Feeder	Gear 48T x 8mm	F4151A (9104399Y)	10		
Tower Feeder	Gear 25T x 8mm	F4152A (9104400Z)	2		
Tower Feeder	Gear 30T x 8mm	F4156A (9104402B)	1		
Two Plate Folder	Upper Transport Roller Shaft Assy .	A2792A (9106799Y)	2		
Two Plate Folder	Motor Pulley (220v)	F1372A (9105627C)	1		
Two Plate Folder	Motor Pulley (110v)	F1373A (9104297S)	1		
Two Plate Folder	Gear 25Tx8mm	F4152A (9104400Z)	3		
Two Plate Folder	Gear 30Tx8mm	F4156A (9104402B)	2		
Two Plate Folder	Belt 100-S2M	F5151A (9105217A)	1		
Two Plate Folder	Spring Heavy pressure	G1117A (9104686X)	6		
Two Plate Folder	Gear 40T x 8mm	F4150A (9104398X)	6		

Module	Description	Part No.	Qty	Notes	Qty
Two Plate Folder	Gear 48T x 8mm	F4151A (9104399Y)	9		
Two Plate Folder	Gear 30T x 8mm	F4156A (9104402B)	1		
Three Plate Folder	Paper Transport Shaft Assy	A2843A (9105453W)	3	Amount for single bin	1
Three Plate Folder	OMR paper Transport Assy	A2844A (9105461E)	3	Amount for single bin	1
Three Plate Folder	Tower access shaft assembly	A2845A (9105463G)	2	Amount for single bin	1
Three Plate Folder	Drive Shaft Jam Access Assy	A2849A (9107327Y)	1	Amount for single bin	1
Three Plate Folder	Drive Shaft Collation Assy	A2851A (9106693N)	1	Amount for single bin	1
Three Plate Folder	Idler shaft collation deskew	A2852A (9106694P)	1	Amount for single bin	1
Three Plate Folder	Eject shaft assy	A7079A (9106894X)	1	Amount for single bin	1
Three Plate Folder	Eject drive shaft assy	A7080A (9106830F)	1	Amount for single bin	1
Three Plate Folder	Bracket Idler wheel assy	B4376A (9105542P)	1	Amount for single bin	1
Three Plate Folder	Roller Fold Rollers	C8175A (9103539C)	3	Amount for single bin	3

Three Plate Folder	Transport roller	D0044A (9103613E)	2	Amount for single bin	2
Three Plate Folder	Belt	F5123A (9104503G)	1	Amount for single bin	1
Three Plate Folder	Belt 100 S2M	F5124A (9104504H)	1	Amount for single bin	1
Three Plate Folder	Belt 384XL	F5137A (9104507L)	1	Amount for single bin	1
Three Plate Folder	Gear 40T x 8mm	F4150A (9104398X)	19	Amount for single bin	18
Three Plate Folder	Gear 48T x 8mm	F4151A (9104399Y)	15	Amount for single bin	9
Three Plate Folder	Gear 30T x 8mm	F4156A (9104402B)	3	Amount for single bin	3

3.24.2 Replacement at 2 million inserts or 1 million inserts if usage is over 8 hours per day

The following parts are recommended to be changed at 2 million inserts in addition to the parts shown in 3.24.1, or at 1 million inserts if the machine is being used for more than 8 hours per day.

NOTE: Part Nos. shown in brackets thus () are SAP numbers.

Module	Description	Part No.	Qty	Notes	Qty
Insert Head	EC30 Clutch	179-214 (9100519G)	2		
Insert Head	EC25 Clutch	181-104 (9100790P)	1		
Insert Head	EC25 Clutch	181-105UL (9100792R)	1		
Insert Head	EC25 Brake	181-117 (9100800Z)	1		
Insert Head	Solenoid	181-119 (9100801A)	1		
Insert Head	EC25 Clutch	181-127 (9100806F)	1		
Insert Head	Solenoid	181-142 (9100816R)	6		
Insert Head	Middle finger Ext op-erator side	B7637A (9105535G)	1		
Insert Head	A.Finger Drives 3 dia	A7368A (9106905J)	1		
Insert Head	Finger Operator side	B9319A (9105583G)	1		
Insert Head	Finger Drive side	B9320A (9105582F)	1		
Insert Head	Sealer roller Top	C8166A (9103532V)	2		
Insert Head	Sealer roller 40mm dia	C8167A (9103533W)	1		
Insert Head	Sealer roller 25mm dia	C8168A (9103534X)	1		
Insert Head	T Bearing	D1040A (9103641J)	20		

Module	Description	Part No.	Qty	Notes	Qty
Insert Head	Dowel pin 3 x 14mm	E5071A (9104133W)	17		
Insert Head	9.5mm E Clip	E5073A (9104134X)	16		
Insert Head	Dowel Pin 3 x 8mm	E5074A (9104135Y)	12		
Insert Head	Polycord Belt	F0052A (9106615G)	1		
Insert Head	Pulley (220 V)	F1372A (9105627C)	1		
Insert Head	Pulley (110 V)	F1373A (9104297S)	1		
Insert Head	Jockey Sprocket	F3004A (9104322T)	2		
Insert Head	Gear 40T x 8mm	F4150A (9104398X)	6		
Insert Head	Gear 48T x 8mm	F4151A (9104399Y)	16		
Insert Head	Gear 25T x 8mm	F4152A (9104400Z)	3		
Insert Head	Gear 30T x 8mm	F4156A (9104402B)	3		
Insert Head	Belt 100-S2M-280	F5112A (9104493W)	1		
Insert Head	Belt set 140XL Poly-urethane	F5119A (9104497A)	1		
Insert Head	Belt set 130XL Poly-urethane	F5120A (9104499C)	1		
Insert Head	EC25 Clutch Pin	G0079A (9104579L)	12		
Insert Head	Wetter Foam Edge	G0135A (9104598F)	2		
Insert Head	Wetter Foam Centre	G0136A (9104599G)	1		
Insert Head	EC30 Clutch pin	G0167A (9105600Z)	2		

Module	Description	Part No.	Qty	Notes	Qty
Insert Head	Spring	G1152A (9104699L)	2		
Insert Head	Shim	G6028A (9104879Y)	10		
Insert Head	Envelope Shim	G6180A (9105641S)	2		
Insert Head	Closer Bearings	P2226A (9105695Y)	4		
Insert Head	EC30 Dowel Pins	P2232A (9105657J)	6		
Insert Head	Bearings 6x8x13.8	E1070A (9103829E)	2		
Feeder	Clutch	181-117 (9100800Z)	1		
Feeder	Clutch	181-127 (9100806F)	4		
Feeder	8mm T Bearing	D1040A (9103641J)	14		
Feeder	Belt 300XL (set)	F5121A (9104501E)	1		
Feeder	Belt 330XL (set)	F5122A (9104502F)	1		
Feeder	Clutch Pin	G0079A (9104579L)	5		
Feeder	Pulley (220 V)	F1372A (9105627C)	1		
Feeder	Pulley (110 V)	F1373A (9104297S	1		
Mark Reading Feed	Clutch	181-117* (9100800Z)	1		
Mark Reading Feed	Clutch	181-127* (9100806F)	6		
Mark Reading Feed	8mm T Bearing	D1040A (9103641J)	16		

Module	Description	Part No.	Qty	Notes	Qty
Mark Reading Feed	Belt 300XL	F5121A (9104501E)	1set		
Mark Reading Feed	Belt 330XL	F5122A (9104502F)	1set		
Mark Reading Feed	Clutch Pin	G0079A (9104579L)	7		
Mark Reading Feed	EC30 clutch pin	G0167A (9105600Z)	1		
Tower Feeder	Brake	179-214 (9100519G)	2		
Tower Feeder	Brake	181-105UL (9100792R)	1		
Tower Feeder	Clutch	181-117* (9100800Z)	2		
Tower Feeder	Brake	181-127 (9100806F)	5		
Tower Feeder	Feed wheel tyre	D0038A (9103611C)	4		
Tower Feeder	8mm T Bearing	D1040A (9103641J)	22		
Tower Feeder	Belt 330XL	F5122A (9104502F)	1 Set		
Tower Feeder	Clutch pin	G0079A (9104579L)	8		
Tower Feeder	EC30 clutch pin	G0167A (9105600Z)	2		
Tower Feeder	Belt 300XL	F5121A (9104501A)	1set		
Two Plate folder	Separator Pickup Clutch	181-117* (9100800Z)	1		
Two Plate folder	Clutch	181-127* (9100806F)	6		
Two Plate folder	Separator Assy	A7097A (9101747L)	1		
Two Plate folder	8mm T bearing	D1040A (9103641J)	22		
Two Plate folder	Belt 300XL	F5121A (9104501E)	1set		
Two Plate folder	Belt 330XL	F5122A (9104502F)	1set		
Two Plate folder	Clutch Pin	G0079A (9104579L)	1		
Three Plate Folder	clutch	181-117 (9100800Z)	5	Amount for single bin	3
Three Plate Folder	Solenoid	181-119 (9100801A)	2	Amount for single bin	2
Three Plate Folder	Collate clutch	181-127 (9100806F)	28	Amount for single bin	19
Three Plate Folder	Eject Roller Shaft Assy	A2894A (9109132D)	2	Amount for single bin	2
Three Plate Folder	Rollers	D0021A (9103602T)	8	Amount for single bin	8
Three Plate Folder	8mm T bearing	D1040A (9103641J)	26	Amount for single bin	18
Three Plate Folder	Timing belt	F5136A (9104506K)	1set	Amount for single bin	1 set
Three Plate Folder	Clutch Pin	G0079A (9104579L)	29	Amount for single bin	18

3.24.3 Replacement at 3 million inserts

The following parts are recommended to be changed at 3 million inserts.
See also 3.24.4 – these parts are in addition to the list below.

NOTE: Part Nos. shown in brackets thus () are SAP numbers.

Module	Description	Part No.	Qty	Notes	Qty
Insert Head	Slow down clutch assy	A7366A (9107374X)	1		
Insert Head	Pin Grooved 2.5 x 14mm	E5078A (9104138B)	4	x4 As-sembled	
Insert Head	Sprocket 15T	F3004A (9104322T)	4	x2 As-sembled	
Insert Head	Sprocket Hub	P2033A (9105679G)	2	x2 As-sembled	
Mark Reading Feed	Motor Pulley (220v)	F1372A (9105627C)	1		
Mark Reading Feed	Upper Transport Shaft OMR	A7337A (9107754T)	1		
Mark Reading Feed	Upper Transport Shaft Barcode.	A7339A (9107755U)	1		
Tower Feeder	Motor Pulley(220V)	F1372A (9105627C)	1		
Tower Feeder	Motor Pulley(110V)	F1373A (9104297S)	1		
Two Plate Folder	Paper Transport Shaft Assy	A2843A (9105453W)	2		
Two Plate Folder	Plate Folder Paper Direction Roller	A7176A (9105430X)	1		
Two Plate Folder	Eject shaft assy	A2790A (9106855G)	1		
Two Plate Folder	Eject shaft assy	A2701A (9107297S)	1		
Three Plate folder	Lenze Clutch	181-128 (9100807G)	1	Amount for single bin	1

3.24.4 Replacement at 3 million inserts or 1.5 million inserts if usage is over 8 hours per day

The following parts are recommended to be changed at 3 million inserts in addition to the parts shown in 3.24.3, or at 1.5 million inserts if the machine is being used for more than 8 hours per day.

NOTE: Part Nos. shown in brackets thus () are SAP numbers.

Module	Description	Part No.	Qty	Notes
Insert Head	Lenze Clutch	181-128 (9100807G)	1	Request items assembled
Insert Head	Pulley 104T	F1404A (9105629E)	1	Request items assembled

3.24.5 Replacement at 4 million inserts

The following parts are recommended to be changed at 4 million inserts.

Module	Description	Part No.	Qty	Notes	Qty
Three Plate Folder	Paper Direction Roller	A7176A (9105430X)	3	Amount for single bin	2